조경학석사학위논문

Plant Selection for Traditional Korean Garden Design by Landscape Types

한국 전통 정원의 설계를 위한 입지 유형별 식물종 선정

2012년 8월

서울대학교 환경대학원

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Abstract

Plant Selection for Traditional Korean Garden Design by Landscape Types

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In recent days, the studies on Korean traditional landscape architecture and the various trials to represent the characteristic of traditional landscape architecture in contemporary landscape architecture works have been increased. Many contemporary represented traditional garden style outdoor spaces are copying the landscape of private retreat (Byulsoe) which has been constructed to live in seclusion or to enjoy scenic landscape in picturesque place. As a constructional principle of private retreat (Byulsoe), 'selecting a good location in beautiful nature' is most essential principle. However, unlike original private retreat (Byulsoe), most of contemporary represented traditional garden style outdoor spaces are located on urban area where has poor vegetation landscape. This leads to failure in sufficient representation of nature-friendly, beautiful landscape of private retreat(Byulsoe). To overcome this limitation of location in modern times, the complementary measure for poor vegetation landscape should be considered in planting design process.

Main objectives of this study is to suggest the ecologically harmonious plants species for traditional landscape architecture and the seleting method for ecological species composition which

can be applied to make a traditional private retreat(Byulsoe) garden style outdoor spaces in urban area where should be complemented because of the poor vegetation landscape. These plants species for traditional landscape architecture and the seleting method for ecological species composition will be accessed from the point of landscape types, and the selecting basis will be the natural vegetation structure analysis data which show the environmental conditions of each landscape types. As a result, these plants species for traditional landscape architecture and the seleting method for ecological species composition will have a possibility to be applied to the ecological planting design for contemporary represented traditional garden style outdoor spaces where should be complemented because of the poor vegetation landscape.

Approach of this study is: (1) to research and list up all kinds of plants species for traditional landscape architecture and those symbolisms which can be used in planting design for traditional private retreat(Byulsoe) garden style outdoor spaces, and (2) to examine the landscape types of exsisting private retreat(Byulsoe) gardens, and (3) to sort out the habitat types of natural vegetation by landscape types. And (4) to collect the the natural vegetation structure analysis data including the habitat types by landscape types and to compare with the list of plants species for traditional landscape architecture and extract common plants species. Finally, to find out the ecologically harmonious plants species compositions by landscape types. Additionally (5) to suggest the examples of plants species selection by landscape types including the ecologically harmonious plants species compositions. In conclusion, this study will expect the possibility of using the plants species for traditional landscape architecture and the seleting method for ecological species composition in planting design for traditional private retreat(Byulsoe) garden style outdoor spaces and the need of following study.

Keywords: Korean traditional garden, representation, landscape types, traditional landscape, plants for

traditional landscape architecture, plants community, ecological plant species composition

Student Number: 2009-22166

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I. Introduction

1.1 Background

Landscape made by adding artificial elements to nature is a result of activities in which nature and culture mingle with each other, and thus it comes to have various styles in a variety of countries or races. The landscape spaces of the three countries in East Asia, that is, Korea, China and Japan have their own respective characteristics. Not like the Chinese grove with splendid decorations and huge scale and the Japanese one with man-created beauty which is thoroughly calculated, the traditional landscape architecture of Korea has the characteristic that it is 'natural'.[1]

"The characteristic of Korean landscape architecture is the excellent choice of location and the superb use of surrounding topography"(Charles Varat, 1842-1893)[2]

There are mansions and pavilions in most places of scenic beauty or with graceful scenery in Korea. Mansions and pavilions are not spectacles suppressing the surrounding scenery. They assimilate with the surroundings as if they are a part of the nature. This is an arrangement at the proper locations as in the words of Charles Varat. It is a scene mixing with the surrounding nature. It considered the locational condition to the utmost and emphasized the functionality while arranging the space organically and in three dimensions. It did not limit the scene of landscape architecture by extending the space and had a fluid shape which changes following the order of time. It was a space representing

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[1] Sun Yee, *Study on Planting in Korean Traditional Landscape Architecture* (Suryusanbang, 2004), p.6.

[2] A French traveller, folklorist. He had travelled Korea from 1888 to 1889, and published "Deux voyages en Coree" after return. Charles Varat and Charles Chaillé-Long, Guisoo Sung[trans.], *Trip to Joseon- Travel Notes of Two Foreigners Who Have been in Joseon 100 Years Ago*, (Seoul: Nunbit, 2001).

the image of constructor by laying stress on symbolical meanings such as a figure of speech, a metaphor and so on.[3]

Recently there are diverse attempts to study the traditional landscape architecture and to represent it in modern landscape architecture. In and around the capital Seoul, there are urban parks with the theme of representation of a Korean traditional garden style: For example, Jung-ang park in Pundang-gu, Heewon in Yongin-shi(Kyunggi-do), National Museum of Korean Yongsan-gu, Korean traditional forest in Yungduengpo-gu, Traditional space in Worldcup stadium in Mapo-gu(Seoul), Korean traditional garden sector in Wolmi park(Inchon) and others.

And also in foreign countries, there are already several theme gardens letting Korean traditional landscape architecture be known: For example, ‘Korean garden’ in Osaka, Japan, ‘Seoul park’ in Cairo, Egypt, ‘Seoul park’ in Paris, France, ‘Seoul garden’ in Berlin, Germany, ‘韓國 庭園’ in Kwantung, China, ‘Koreanischer Garten’ in Frankfurt, Germany and others.

Among the urban parks of the traditional garden type formed in Korea, there are cases that rely on the placeness of the region relating with national spirit[4], cases without characteristics of place but with the intention to express the ideal of modern men on traditional space[5] or cases that are built as parks of the traditional garden type by the guidelines for design from ordering body[6].

These contemporary represented gardens are mostly the spaces built by reproducing the characteristic principles of space composition, adding elements of traditional landscape architecture that are utilized as a design theme. There are opinions criticizing these contemporary represented

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[3] Sun Yee, *Ibid*, pp.32-33.

[4] For example, 'Wongudan Park'(2000) was constructed on the ground of altar in Joseon era and 'National Museum of Korea'(2003) was constructed on the return ground from US Forces in Korea.

[5] For example, 'Bundang Central Park'(1990).

[6] For example, 'Hee Won' of Ho-Am Art Museum(1997)) and 'the Traditional Garden of Korea(2002)' of Wolmi Park. The guidelines from the ordering body

gardens that they are staying at the straightforward representation, that the methods of representation are not diverse, and that they are are not more than an enumeration of traditional elements like a museum (Kijun Nam, 2006) or a sort of collage of style (Inkyoung Park, 2006). Elements of traditional landscape architecture are often introduced to the space of housing developments, which are the places of residence in the modern times, and this is used for characterization of space and as an element of forming an image as high-class apartment complex[7].

Many cases of the parks of the type of contemporary represented gardens (for example, National Museum of Korea, the Forest of Korean Traditions in Yeouido, Wolmi Park and so on) or the landscape space of the type of traditional garden formed in apartment complexes imitate the scene of the rear gardens of palaces such as the Secret Garden (秘園) or the private retreat so-called Byeolseo (別墅). (see the Figure 1.1)

<Figure 1.1 Examples of the Contemporary Represented Traditional Garden Style Landscape Space: from left, Heewon of Ho-Am Art Museum, Traditional Space in Worldcup Stadium in Mapo-gu, Seoul, Traditional Space of Raemian Apartment in Sungnam-shi>

A private retreat(Byeolseo, 別墅. Hereinafter 'private retreat') is a kind of private villa garden with great scenery which is formed for the purpose of retirement and seclusion or pure enjoyment of nature in a nearby picturesque place or rural area.

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[7] Sunyoung Oh, A Study on Representing Traditional Garden in Wolmi Park as Urban Parks, Unpublished Master Dissertation(University of Seoul, 2010), p. 3

The characteristic of byeolseo gardens, which were formed in nearby picturesque places or rural areas to enjoy retirement, seclusion or the nature, is that mansion (樓, hereinafter 'Lu') and pavilions(停, hereinafter 'Jung'), in which people can view the scenes, were built in beautiful natural scenes[8]. The location of byeolseo gardens are in general picturesque places with mountains and waters, and thus the structure of space greatly depends on the natural topography and the flow of mountain streams, and the location achieves the original purpose of 'the union with the nature' by minimizing the artificial operation to the existing natural scenes.

However, the traditional spaces of landscape architecture formed in the modern times have a scene which is quite different from the private retreats (byeolseo) that we know. And what is the reason for that?

First, 'location' is the most important element in the formation of the traditional private retreats as aforementioned, but the subject areas of the traditional gardens being represented today are mostly some level land of downtowns or neighborhood of cities not like the traditional private retreats that mostly were located in picturesque places with graceful mountains and waters[9].

Due to the limitations of these locations, the traditional gardens being represented today have no natural vegetation landscape such as mountains, riversides or coasts as an outer garden or as background scenery. In addition, in them, Lu or Jung and Jidang (池塘) are represented on the level land in a straightforward way and monotonous planting focusing on tall pine trees is conducted around them. Thus, they can't help being different from the scenes of inner garden in which several species of trees were planted for symbolic meaning, and also following principle of fairness or avoidance of

[8] The Association of Korean Traditional Landscape Architecture, *the Cultural History of Oriental Landscape Architecture* (Daega, 2011), p.258

[9] Sunyoung Oh, *op. cit*., p. 111

planting (配植宜忌).

In order to overcome the issue of limitations of location, 1) complementary measures on topography and 2) complementary measures in the part of improving the poor natural vegetation landscape should be considered together. A further step would be a consideration for symbolic meaning.

As a case of introducing complementary measures in the parts of topography, Hee Won, to direct scene like the private retreats in mountainous districts, formed an artificial mounding and planted pine trees, zelkova trees, Japanese apricot trees and so on. Also, the Korean Garden of Kwangtung built recently has created the atmosphere of a byeolseo garden by forming a natural mountain stream like the valleys in Korea by using the topography with great difference of altitude[10]. These cases have understood and complemented the location of private retreats relatively well.

However, the contemporary parks representing traditional gardens have not found solutions in the complementary measures for planting and topography that can improve the poor natural landscape condition of the site. Most parks representing traditional gardens were designed and constructed as a stroll, while planting some species of tree mostly monotonously focusing on pine trees without any ecological consideration. Many cases resulted in improper planting management with poor ecological sustainability and failed to achieve anything in the direction of an authentic natural scene of an original private retreats.

The urban park designed as traditional garden should arrange and apply a planting model representing the planted species, number of species and number of individuals for each layer(tree layer, tree-2 layer and shrub layer) to be suitable for the ecological status of each set of species as has been

[10] Ilhwan Jung, The Study on the Improvement Program for the Tradition of Korean Garden in the Foreign Cities, Unpublished Master Dissertation(University of Seoul, 2010), p.85

suggested for Wolmi Park[11]. The rearing of trees selected to be introduced should be considered from the stage of working design and the trees proper for traditional space should be decided upon through a review of related papers and the data of plants for traditional landscape architecture such as Sanrimkyongjae(山林經濟), Imwonsibyukji(林園十六志) and so on as has also been proposed[12]. However, though this does not provide an ecological planting model tuned to the traditional garden with the plants for traditional landscape architecture, and stay at only stressing that the selection and ecological use of plants for traditional landscape architecture are important.

The private retreat(byeolseo) was an Utopia made in nature as a fixed abode. It was a garden friendly to nature that was formed as a minimum inner garden within the fence and maximum outer garden belonging to viewshed beyond the fence. They were ecologically sustainable because they existed by assimilating with the natural vegetation, and for this reason, many old private retreats are still maintained up until now to show their own beauty. In order to coincide with the original intentions to 'go into and unite with nature', when making a private retreat, there should be planting measures to complement the poor natural vegetation landscape of the site to be similar to the beautiful and rich natural vegetation landscape of picturesque places. This can be seen as the start of representation of traditional private retreats with ecological sustainability.

1.2 Objectives

The characteristic of traditional gardens is that the elements harmonize with each other and

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[11] Kyungho Sung, A Feasibility Study on the Establishment of Planting Concept and the Appropriate construction in City Park: A Case of Youido Park, Seoul, Collection of Dissertations in Spring Conference 2005, p.105

[12] Sunyoung Oh, *op. cit.*, p. 109

look as natural as in their original appearance. In the representation of traditional gardens, this harmony of elements is important, and the sense of beauty of tradition comes to be felt with this natural harmony. In addition, the traditional gardens have their values in the ecological sustainability in which they continue to be still beautiful even when time has passed.

It is possible to complement the background scenery and the outer garden, when it has poor natural vegetation, by adding the traditional plants materials which are ecologically harmonious. It is also possible to introduce in the inner garden the traditional plants with symbolic meaning that are suitable to traditional planting methods in representing traditional private retreat type gardens. Then, by representing a whole vegetation landscape, it is possible to develop nature-friendly private retreats with ecological sustainability, without compromising original symbolic meanings.

This study aims to find the species of plants for traditional landscape architecture and their desirable ecological species composition that can be utilized for the planting design of inner and outer gardens of private retreats. The purpose of this study is to propose several ecological and traditional indicators that can be considered for the formation of traditional gardens, so that a private retreat is represented ecologically sustainable as a vegetation landscape, nature-friendly close to the original idea.

1.3 Scope and Methods

The types of Korean traditional gardens can be largely divided into the era before Koryo, the era of Koryo, and the era of Joseon in historical aspect, but, this study limited its subject to the traditional gardens of the era of Joseon whose gardens are remaining to become the model of most traditional gardens currently being represented and whose planting can still be examined in after historic places. In addition, the traditional gardens of Joseon can be divided into palaces, royal tombs,

lecture halls, Confucian temples, Buddhist temples, private houses and byeolseo following the personality of the formed spaces, but, this study limited the subject to the private retreats that reveal the attributes of Korea's own landscape architecture which is nature-friendly the best. And also it is because most of the recently constructed traditional style gardens attempt to represent the style of the private retreat.

This study first examined the background of formation and principles of construction of byeolseo private retreats through literature. In addition, this study examined the location, type of scene and vegetation landscape of the existing historical private retreats in order to grasp the location types of private retreats.

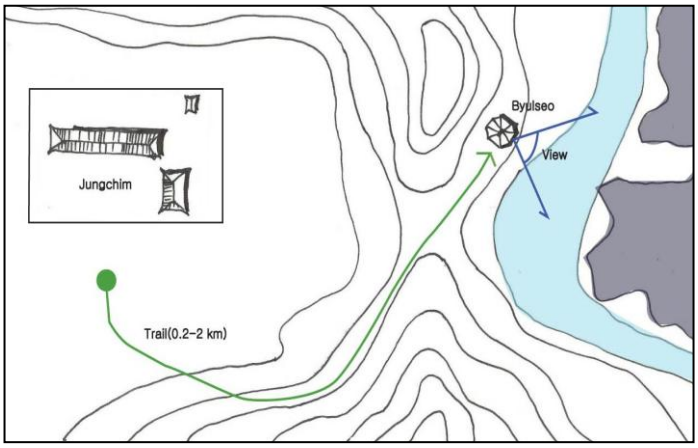
This study examined the plants for traditional landscape architecture used in the era of Joseon by referring to the old literature and documentary records for the selection of plant materials to use for representation of vegetation landscape of private retreats, and looked for the species of plants for traditional landscape architecture with interspecific affinities by comparing with the data of phytosociological analysis of natural vegetation set of species of national scope in order to find the plant species suitable to each landscape types of private retreats among the plants for traditional landscape architecture.

II. Research on Private Retreats (Byeolseo)

2.1 Characteristic of Byeolseo Private Retreats[13]

Definition and Background for Formation

A byeolseo (別墅) is a second house formed for the purpose of retirement and seclusion or pure enjoyment of nature in a nearby picturesque place or rural area away from one's house. The qualification for byeolseo is to have one's house back home(one's home or village) which is jeongchim (正寢), and the distance should be within the walking sphere and be located away from the jeongchim by 0.2 through 2km in general but sometimes much more. (Refer to figure 2.1)

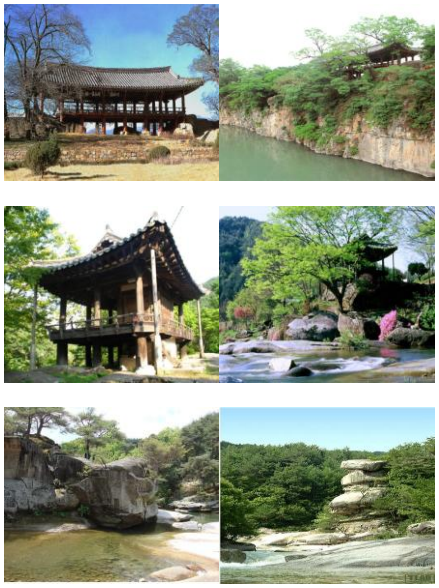


< Figure 2.1 Conceptual Diagram of Byeolseo>

The characteristic of buildings of byeolseo is to let appreciate the scenes of mountains and waters in the nature by installing a Lu or a Jung or by establishing a platform, not constructing a fence or a gate so that one can view the surrounding scenes. A Lu (樓) is a building with walls two-storied pavilion, and a Jung (亭) has a more open structure, and is much smaller in scale. A platform (臺,

[13] The Association of Korean Traditional Landscape Architecture, *op. cit.*, p.259-300

hereinafter 'Dae') is not a building, is a flat and projecting stone or place and one can view the scenery from it.(see Figure 2.2)



< Figure 2.2 Examples of 樓, 亭, 臺: from the top, Juksoeru in Samchoek, Yongamjung in Goechang, Suseungdae and Aneumsongdae in Goechang[14]>

A byeolseo is highly related to Jung and Dae. There are the type of villa and the type of manor, and most byeolseos in the regions of Seoul, Gyeonggi, Chungcheong, Youngnam and Honam are the type of villa.

The origin of byeolseo can be found in the Imcheon Garden (林泉庭園) of the era of the Three States, and a number of byeolseo were formed in the era of Joseon as 1) the tendency of seclusion beyond the mundane world and the retirement as an escape prevailed due to the intensification of massacre of scholars and party strife and 2) with the influence of the view of nature conforming to the nature and the Taoism. In addition, there was a geographical reason that there were many picturesque places with the formation of rank of spaces with difference of grade due to a variety of topography.

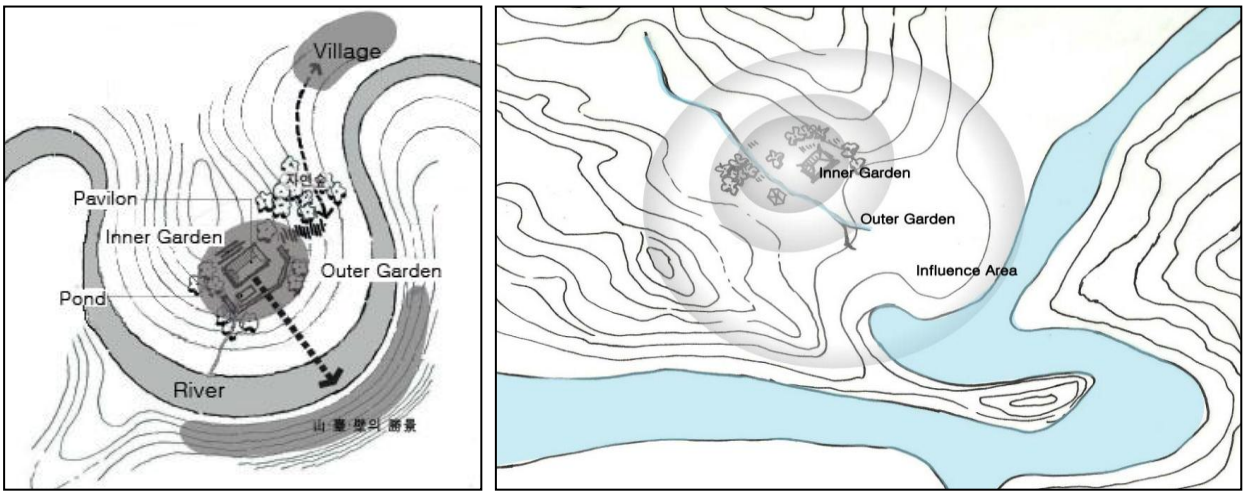
Location and Space Organization

The characteristic of location of byeolseo private retreats is that they are located in the

[14] Pictures from Cultural Heritage Administration, http://www. Cha. go. kr

picturesque places with graceful mountains and waters and that they are within the walking sphere not totally isolated from one's house back home where one resides. They are isolated from the house back home visually or ideally or in a complex way.

The external space organization of the gardens is divided into the inner garden within the fence, the outer garden belonging to viewshed beyond the fence and the influence area that can indirectly affect the space of gardens, and the subject of appreciation of byeolseo garden included not only the inner garden but also the external landscape including the outer garden. Therefore, even when there is a border between the inner garden and the outer garden with the fence, the scope of planting was not limited to the inner garden, and the scope of planting was extended to the area of outer garden when needed for the beauty of scenes. (see the figure 2.3)



<Figure 2.3 The Conceptual Diagram of Exteral Space Organization>[15]

Lu and Jung, through 'the empty shape', enable us to view the widely opened scenes in the far distance (遠景) and make it possible to view a number of scenes in Lu and Jung by drawing the scenes

[15] Left diagram from Hyunsoo So, An Ecological Interpretation on the Principles of Traditional Landscape Architecture, Unpublished Ph.D. Dissertation(University of Seoul, 2008), p.242

into the Lu and Jung (取景) or to surround the Lu and Jung with natural scenes (環景) or to make the natural scenes come into the Lu and Jung (挹景). In order to make the Lu and Jung empty, the shape of construction should be made as simple and artless as possible, and it is important to choose an excellent location to obtain diverse scenes[16]. And outside natural scenery was an inportant part of garden appreciation.

Private Retreats as the Subject of Enjoying (玩賞)

> "Water in the valley... its purity is self-possessed and does not take a rest permanently, and scholars cultivating their moral sense should be let clean their minds by making strenuous efforts looking at the water and stay at and never leave goodness by recovering their nature."(Kwon Keun, 1352-1409) [17]

<Figure 2.4 Sehwang Kang, part of <池上篇圖>, 1748, colored on paper, 20.3 x 61 cm>

Lu or Jung almost always appears in the traditional landscape paintings, and everywhere is in combination with trees and thereby in harmony, and scholars are sitting and enjoying the nature in most of the landscapes. To enjoy the nature with the virtues of noble men was to understand the reason

[16] The Association of Korean Traditional Landscape Architecture, *op. cit.*, pp.262-264

[17] A Scholar in former era of Josoen. He wrote the famous poems appreciating the beauty of private retreats.

of the universe and to realize that the nature and oneself have an organic association[18].

The main subject of enjoying was the surrounding natural scenes and plants for landscape architecture, and this can be known by examining the Chinese poems of arbor (樓亭漢詩) whose materials are private retreats (the famous Chinese poems of arbor of Toegye, Lee Eonjeok, Kwon Keun and so on). In case of the Soswaewon 48 Yeong (瀟灑園四十八詠)[19], 24 pieces are about the beauty and meaning of plants. The plants for landscape architecture not only are the subject of enjoying but also have symbolic meanings following their physiology and shape, and they sometimes became the medium to express the image of constructor insinuatively. That is, they did not simply describe the scenes or things seen with the bare eyes but expressed the immanent meaning[20].

Ecological Constructional Principles of Private Retreats

The construction of outer gardens is deeply related to the selection of location. The constructional principle of outer gardens was to select the location using the surrounding natural vegetation landscape as water became the main subject of scenes without a particular construction.

The constructional techniques of inner gardens were as follows. 1) They arranged buildings by using the natural topography as it is, and it was not always the case that there was a fence distinguishing the inner gardens from the outer gardens. 2) The inner gardens included one or more Jung, and sometimes the Jung included rooms. 3) They arranged water scene elements such as ponds or mountain streams 4) and spectacles and rocks. 5) The trees for traditional landscape architecture

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[18] Youngtaek Park, The Meaning of the View of Nature and House in Traditional Landscape Paintings, Culture study of the Korean Vol.33 2010, p. 39

[19] Chinese poems that depict and appreciate the beautiful 48 scenes of Soswaewon written by Haseo Kim Inhoo(河西 金麟厚, 1510-1560)

[20] Sun Yee, *op. cit.*, p.330

such as pine trees, zelkova trees, bamboos, lotus and so on were planted following the symbolical, functional and "ecological" characteristics, but the techniques of group planting and single planting were used together. (see Figure2.5)

Wall	Jung	Pond or Stream	Spectacles or Rocks	Plants
 	  	  	  	 

< Figure 2.5 The Constructional Techniques of Inner Gardens >[21]

Points of Contact with Modern Ecology

The aforementioned constructional principles of traditional private retreats, that is, the use of land as the natural shape, nature-friendly buildings and arrangement and use of plant materials suitable to the climate can meet the principles[22] of modern ecological landscape architecture design oriented to ecological recovery on the basis of sustainability through the ecological soundness and input of

[21] Pictures from *Korean Traditional Garden*, Korea National Arboretum, 2011

[22] Minsoo Lee, Un Urban Ecological Park Design Study with the Application of the Theory of Landscape Ecology: A Case Study of Namyangju Jinjeop, Gyunggido, Unpublished Master Dissertation (University of Hanyang, 2008), p.21

minimum energy.

It can be seen that though the ancestors did not know the term 'ecology', the thoughts respecting life and attitude toward life adjusting themselves to the nature of the traditional society share the context with the ecological thinking of today, and that naturally it was possible to form the traditional gardens which were ecologically sustainable, automatically.

2.2 Plants for Traditional Landscape Architecture in Private Retreats

Requirements of Plants for Traditional Landscape Architecture

There are not so many plants growing around us that can be named as a plant for traditional landscape architecture. Those that our ancestors frequently planted, grew and appreciated such as pine trees, Japanese apricot trees, bamboos and so on can be called plants for traditional landscape architecture. The common features of these plants are 1) that they are plants that can adapt to the natural environment of Korea and live for themselves (wild growth 自生性), and 2) that they are plants with symbolical, scenic and practical significance (symbolism 象徵性). These two features can be called as the basic requirements for classification of plants for traditional landscape architecture[23].

History of Plants for Landscape Architecture in Korea

The examples of plants for landscape architecture that meet the requirements of plants for traditional landscape architecture and that have been planted frequently in reality can be found through the old literature materials along with those that can be found in the existing traditional gardens. Forty species of plants for landscape architecture of up until the era of Koryo that were written in some

[23] Sun Yee, *op. cit.*, pp. 586-587

history books[24] have been found by previous studies, but there are almost no such garden still exists, and thus there is no way to identify it. However, according to historical materials, in the era of Koryo, various flowers were introduced from China and planted, and in particular, the peony was loved.

In the era of Joseon, the selection of location of traditional gardens, selection of plants for landscape architecture, planting techniques and so on came to develop due to the influence of Confucianism and the theory of configuration of the ground, and the tidy and artless plants symbolizing noble fidelity were preferred not like in the era of Koryo. As still there are many remaining traditional gardens that were constructed in the era of Joseon, the present condition of planting can be known, and the plants for landscape architecture loved in the era of Joseon can be checked through various books[25] dealing with diverse garden plants and plants for landscape architecture and history books such as the Annals of the Joseon Dynasty (朝鮮王朝實錄).

<Figure 2.6 The Popular Four Plants for Landscape Architecture in Joseon era: Plum, Orchid, Chrysanthemum and Bamboo>[26]

In the early days of Joseon, the plants for landscape architecture in the era of Koryo still were the mainstream, and the species of trees with the origin of China and *Rhododendron indicum* (日本 躑

[24] 三國遺史, 三國史記, 東國李相國集, 破閑集, 補閑集, 高麗史 etc.

[25] 養花小錄, 花菴隋錄, 山林經濟, 林園十六誌, 芝峰類說 etc.

[26] 'The Four Gracious Plants' of Pyoam Kang Sehwang(豹庵 姜世晃, 1712-1791)

躅) with the origin of Japan were in fashion. In the middle of Joseon, the indigenes increased and fruit trees such as pear trees, peach trees, chestnut trees and so on started to be planted widely. In the later days of Joseon, the interest on horticulture and gardening increased sharply, and the species of trees became more diverse, and various imported flowering plants were planted frequently.

Examination on Plants for Traditional Landscape Architecture

This study examined plants that are acknowledged to have been planted as plants for traditional landscape architecture and are mentioned as plants for landscape architecture in historic materials. And the subjects of research were such historic sources as Yanghwasorok(養花小錄), Hwaamsurok(花菴隋錄), the Bokgeo(卜居), Yanghwa(養花) and Jongsu(種樹) parts of Sanrimkyongjae(山林經濟) and and Jibongyuseol(芝峰類說) which are the books related to gardening and horticulture in the era of Joseon, checking on previous studies[27] on plants for landscape architecture of Joseon. About 124 species of plants used in the era of Joseon were found. (see the table 2.1)

Of these 124 species, about 76 species have been traced in previous studies, this study adds 48 Species more as found in sources: Yanghwasorok(養花小錄), Hwaamsurok(花菴隋錄) Yewonji(藝園志) of Imwonsibyukji(林園十六誌). Among new added species, 26 species are perennial and annual flowering herbs which have been planted and grown to appreciate in inner garden or front yard. And the other species are trees(16 species) and shrubs(6 species). There are many herbs in the new found

[27] Younghwal Yoon, "A Study on the Trend of Selection for Garden Trees in Li-Dynasty and the Present-Day", *Journal of Korean Garden Association*, 3(1),1984, pp.252-254. Dongoh Jung, "Plants for Landscape Archtecture in Soswawon", Journal of Honam Cultural Study, Vol.9, 1976, pp.138, 153-154. Woohyuk Byun, A Study on Trees and Tree Arrangement n the Planting of YI-Dynasy Gardens, Unpublished Masters Dissertation, (Seoul National University, 1976), pp.29-39 . Natural Heritage Center, General Overview of the Traditional Planting materials, http://www.nhc.go.kr/natural/info/report (searching date: April 6, 2012)

species. Becuase the Korean(Hanguel) version of Imwonsibyukji(林園十六誌) was published only recently[28], it might be uneasy to access to the source for the previous studies. The new added species are shown with violet shade in table 2.1. (see page 20-22)

In reference to characteristics of the plants, the deciduous broad-leaved trees occupied 58%, the evergreen conifers occupied 15% and flowering plants occupied 23% of the examined plants for traditional landscape architecture, and the ratio of deciduous broad-leaved trees was higher than that of evergreen conifers. About the reason why the deciduous broad-leaved trees were used more than the evergreen conifers, 1) there is an opinion that there was a tendency avoiding evergreen trees quoting the part "avoiding the evergreen trees that are green alone in the winter" of Sanrimkyongjae[29], but 2) the deciduous broad-leaved trees were used more because they change in each of the four seasons and thus various scenes of them can be appreciated[30], and 3) the evergreen trees account for only 20-30% of the natural vegetation of Korea, and thus the ratio of use of evergreen trees is naturally smaller in the traditional gardens[31].

In addition, the kinds of flowering trees were diverse and very few wild flowering plants were used as an herb and the imported flowering plants for enjoying(e.g. Althaea rosea, Musa basjoo. Up to 35% of herbs) were frequently used as an herb. In addition, the ratio of fruit trees(about 20% of trees and shrubs) with the practical and symbolical significance at the same time was also considerably high.

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[28] The Korean(Hanguel) version of Imwonsibyukji(林園十六誌) has been published by part from various publisher since 2005.

[29] Uhyuk Byun, *Ibid.*, p.43.

[30] Many Chinese poems appreciating private retreats(樓亭漢詩) such as Sungsanbyulgock(星山別曲) of Songgang Joelchul(松江 鄭澈, 1536-1593), Myunangjungga(俛仰亭歌) of Song soon(宋純, 1493-1583) are consisted of beautiful scenery of four seasons. It means ancesters thought the changeable landscape following passing of time is meaningful.

[31] Sun Yee, *op. cit.*, pp. 378

In reference to old names of the plants, all the *Quercus spp*. were called as '櫟 ' without distiction between each species except for *Quercus accutissima*(橡). It is because the acorns from *Quercus spp*. were used for foods without distiction.[32] In a case of Salix spp., the previous studies(Yoon, Jung) considered all the *Salix spp.* as '柳'. However, there is a theory saying that the *Salix spp.* with upward branch such as *Salix chaenomeloides* was called as '楊' and the *Salix spp.* with downward branch such as *Salix pseudolaslogyne* was called as '柳'.[33] So this study wrote the *Salix spp*. as '楊柳'. In a case of *Zelkova serrata*, used to be planted as a symbol tree in front of village, was called as '槐' or '槐木' same as *Sophora japonica*[34]. So this study wrote the *Zelkova serrata* and *Sophora japonica* as '槐'.

In this study, the grafted species such as 紅壁桃(grafted subspecies of peach tree) and the unknown plant names which can not know the exact species such as 玉美人, 纏支牧丹, 草松 etc. were excluded in the list.

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[32] Hongsun Hong, *Tree Culture in Korea*(Seoul: Munyaesanchaek, 1996), p.87

[33] Sanghee Lee, *Korean Culture about Flower*(Seoul: Nexus, 2004), vol. 2, pp. 135-136.

[34] Sanghee Lee, *Ibid*., p.151. The author says that it is because the shape and planting purpose of Zelkova serrata were looking like those of Sophora japonica.

< Table 2.1 The List of The Plants for Traditional Landscape Architecture>

Layer	The Plants for Traditional Landscape Architecture				
	Korean name	Old name	Scientific name	Origin	Characteristic
Tree	1 전나무	檜	*Abies holophylla*	Korea	Evergreen coniferous tree
	2 단풍나무	丹楓	*Acer spp.*	Korea	Deciduous broadleaf tree
	5 가중나무	椿	*Ailanthus altissima*	China	Deciduous broadleaf tree
	6 자귀나무	夜合樹	*Albizia julibrissin*	Korea	Deciduous broadleaf tree
	7 오리나무	赤楊	*Alnus japonica*	Korea	Deciduous broadleaf tree
	12 박달나무	檀	*Betula schmidtii*	Korea	Deciduous broadleaf tree
	15 서어나무	西木	*Carpinus laxiflora*	Korea	Deciduous broadleaf tree
	17 밤나무	栗	*Castanea crenata*	Korea	Deciduous broadleaf tree
	18 참죽나무	椿	*Cedrela sinensis*	China	Deciduous broadleaf tree
	123 팽나무	樸樹	*Celtis sinensis*	Korea	Deciduous broadleaf tree
	124 계수나무	桂樹	*Cercidiphyllum japonicum*	Japan	Deciduous broadleaf tree
	21 모과나무	木瓜	*Chaenomeles sinensis*	China	Deciduous broadleaf tree
	25 산수유	山茱萸	*Cornus officinalis*	China	Deciduous broadleaf tree
	30 감나무	柿	*Diospyros kaki*	Korea	Deciduous broadleaf tree
	31 고욤나무	小柿	*Diospyros lotus*	Korea	Deciduous broadleaf tree
	35 벽오동	梧	*Firmiana simplex*	China	Deciduous broadleaf tree
	37 은행나무	銀杏	*Ginkgo biloba*	China	Deciduous broadleaf tree
	48 가래나무	楸	*Juglans mandshurica*	Korea	Deciduous broadleaf tree
	49 호도나무	胡桃	*Juglans regia*	China	Deciduous broadleaf tree
	50 향나무	檜柏	*Juniperus chinensis*	Korea	Evergreen coniferous tree
	51 눈향나무	萬年松	*Juniperus chinensis var. sargentii*	Korea	Evergreen coniferous tree
	52 음나무(엄나무)	嚴木	*Kalopanax pictus*	Korea	Deciduous broadleaf tree
	53 배롱나무	紫薇花	*Lagerstroemia indica*	China	Deciduous broadleaf tree
	57 목련	木蓮	*Magnolia denudata*	Korea	Deciduous broadleaf tree
	58 능금나무	林檎	*Malus asiatica*	Korea	Deciduous broadleaf tree
	61 뽕나무	桑	*Morus alba*	korea	Deciduous broadleaf tree
	62 산뽕나무	柘	*Morus bombycis*	Korea	Deciduous broadleaf tree
	69 오동나무	桐	*Paulownia coreana*	Korea	Deciduous broadleaf tree
	70 후박나무	厚朴	*Persea thunbergii*	korea	Evergreen broadleaf tree
	73 소나무	松	*Pinus densiflora*	Korea	Evergreen coniferous tree
	74 잣나무	栢	*Pinus koraiensis*	Korea	Evergreen coniferous tree
	75 해송(곰솔)	海松	*Pinus thunbergii*	Korea	Evergreen coniferous tree
	77 사시나무	白楊	*Populus davidiana*	Korea	Deciduous broadleaf tree
	78 살구나무	杏	*Prunus armeniaca*	China	Deciduous broadleaf tree
	79 옥매	玉梅	*Prunus glandulosa*	Korea	Deciduous broadleaf tree
	81 매화나무	梅	*Prunus mume*	China	Deciduous broadleaf tree
	82 복숭아나무	桃	*Prunus persica*	China	Deciduous broadleaf tree
	83 자두나무	李	*Prunus salicina*	China	Deciduous broadleaf tree
	84 벚나무	櫻	*Prunus serrulata, Prunus sargentii*	Korea	Deciduous broadleaf tree
	87 배나무	梨	*Pyrus spp.*	Korea	Deciduous broadleaf tree
	88 상수리나무	橡	*Quercus acutissima*	Korea	Deciduous broadleaf tree
	89 참나무(갈참)	櫟	*Quercus aliena*	Korea	Deciduous broadleaf tree
	90 참나무(신갈)	櫟	*Quercus mongolica*	Korea	Deciduous broadleaf tree
	91 참나무(졸참)	櫟	*Quercus serrata*	Korea	Deciduous broadleaf tree
	92 참나무(굴참)	櫟	*Quercus variabilis*	Korea	Deciduous broadleaf tree
	102 버드나무(왕버들	楊柳	*Salix chaenomeloides*	Korea	Deciduous broadleaf tree
	103 버드나무	楊柳	*Salix koreensis*	Korea	Deciduous broadleaf tree
	104 버드나무(능수버	楊柳	*Salix pseudolasiogyne*	Korea	Deciduous broadleaf tree
	107 회화나무	槐	*Sophora japonica*	China	Deciduous broadleaf tree
	110 위성류	渭城柳	*Tamarix chinensis*	China	Deciduous broadleaf tree
	111 주목	赤木	*Taxus cuspidata*	Korea	Evergreen coniferous tree
	113 측백나무	柏	*Thuja orientalis*	China	Evergreen coniferous tree
	114 비자나무	榧子	*Torreya nucifera*	Korea	Evergreen coniferous tree
	116 느릅나무	榆	*Ulmus davidiana*	Korea	Deciduous broadleaf tree
	120 느티나무	槐	*Zelkova serrata*	Korea	Deciduous broadleaf tree
	122 대추나무	棗	*Zizyphus jujuba*	Korea	Deciduous broadleaf tree

	Korean name	Old name	Scientific name	Origin	Characteristic
Shrub	4 다래	藤梨	*Actinidia arguta*	Korea	Deciduous broadleaf shrut
	13 회양목	黃楊木	*Buxus microphylla*	Korea	Evergreen broadleaf shrub
	14 동백나무	山茶花	*Camellia japonica*	Korea,Chir	Evergreen broadleaf shrub
	20 박태기나무	紫荊	*Cercis chinensis*	China	Deciduous broadleaf shrut
	22 납매	蠟梅	*Chimonanthus praecox*	China	Deciduous broadleaf shrut
	24 귤나무(유자)	橘 (柚子)	*Citrus unshiu*	China	Evergreen broadleaf shrub
	26 개암나무	榛	*Corylus heterophylla*	Korea	Deciduous broadleaf shrut
	28 서향	瑞香	*Daphne odora*	China	Deciduous broadleaf shrut
	32 보리수나무	菩提樹	*Elaeagnus umbellata*	Korea	Evergreen broadleaf shrub
	33 사철나무	杜沖	*Euonymus japonicus*	Korea	Evergreen broadleaf shrub
	34 무화과	無花果	*Ficus carica*	Mediterra	Deciduous broadleaf shrut
	36 치자나무	梔子	*Gardenia jasminoides for. grandiflora*	China	Deciduous broadleaf shrut
	40 무궁화	槿	*Hibiscus syriacus*	East Asia	Deciduous broadleaf shrut
	43 수국	紫陽花(繡球)	*Hydrangea macrophylla*	China	Deciduous broadleaf shrut
	47 황매(영춘화)	黃梅	*Jasminum nudiflorum*	China	Deciduous broadleaf shrut
	54 광나무	女貞	*Ligustrum japonicum*	Korea	Evergreen broadleaf shrub
	59 아그배나무	海棠	*Malus sieboldii*	Korea	Deciduous broadleaf shrut
	67 모란	牧丹	*Paeonia suffruticosa*	China	Deciduous broadleaf shrut
	76 탱자나무	枳	*Poncirus trifoliata*	Korea	Deciduous broadleaf shrut
	80 당옥매(산이스라	郁李	*Prunus japonica*	China	Deciduous broadleaf shrut
	85 앵도나무	櫻桃	*Prunus tomentosa*	Korea,Chir	Deciduous broadleaf shrut
	86 석류나무	石榴	*Punica granatum*	Mediterra	Deciduous broadleaf shrut
	94 왜철쭉	日本 躑躅	*Rhododendron indicum*	Japan	Semi-evergreen broadleaf
	95 진달래	杜鵑花	*Rhododendron mucronulatum*	Korea	Deciduous broadleaf shrut
	96 철쭉	躑躅	*Rhododendron schlippenbachii*	Korea	Deciduous broadleaf shrut
	97 참꽃나무(영산홍	映山紅	*Rhododendron weyrichii*	Korea	Deciduous broadleaf shrut
	98 복분자딸기	覆盆子	*Robus coreanus Miquel.*	Korea	Deciduous broadleaf shrut
	99 월계화	四季花	*Rosa chinensis*	China	Deciduous broadleaf shrut
	100 장미	薔薇	*Rosa hybrida*	China	Deciduous broadleaf shrut
	101 해당화	海棠花,玫瑰	*Rosa rugosa*	China	Deciduous broadleaf shrut
	108 조팝나무	繡線菊	*Spiraea prunifolia*	Korea	Deciduous broadleaf shrut
	109 정향나무	丁香	*Syringa velutina*	Korea	Deciduous broadleaf shrut
	112 차나무	茶	*Thea sinensis*	China	Evergreen broadleaf shrub
	117 산앵도	山櫻	*Vaccinium koreanum*	Korea	Deciduous broadleaf shrut
	118 포도나무	葡萄	*Vitis vinitera*	West Asia	Deciduous broadleaf shrut
	119 등나무	藤	*Wisteria floribunda*	Korea	Deciduous broadleaf vine

	Korean name	Old name	Scientific name	Origin	Characteristic
Herb	3 석창포	石菖蒲	*Acorus gramineus*	Korea	Perennial plant
	8 접시꽃	蜀葵	*Althaea rosea*	China	biennial plant
	9 색비름	老小年,雁來紅	*Amaranthus tricolor*	India	annual plant
	10 베고니아	秋海棠	*Begonia*	America	annual plant
	11 범부채	射干	*Belamcanda chinensis*	Korea	Perennial plant
	16 홍화(잇꽃)	紅藍	*Carthamus tinctorius*	Korea	annual plant
	19 맨드라미	鷄冠花	*Celosia cristata*	Asia	annual plant
	23 국화	菊	*Chrysanthemum spp.*	Korea	Perennial plant
	27 난(보춘화)	蘭	*Cymbidium spp.*	Korea, Chi	Perennial plant
	29 패랭이꽃	石竹	*Dianthus chinensis*	Korea	Perennial plant
	38 해바라기	秋葵(葵花)	*Helianthus annuus*	America	annual plant
	39 원추리	萱	*Hemerocallis fulva*	East Asia	Perennial plant
	41 비비추	紫玉簪	*Hosta longipes*	Korea	Perennial plant
	42 옥잠화	玉簪花	*Hosta plantaginea*	China	Perennial plant
	44 봉선화	鳳仙	*Impatiens balsamina*	India, Chir	annual plant
	45 띠	白茅	*Imperata cylindrica var. koenigii*	Korea	Perennial plant
	46 금전화(금불초)	金錢花	*Inula britannica var. japonica*	Korea	Perennial plant
	55 하늘나리	山丹	*Lilium concolor*	Korea	Perennial plant
	56 동자꽃	翦春(秋)羅	*Lychnis cognata*	Korea	Perennial plant
	60 당아욱	錦葵	*Malva sinensis var. mauritiana*	Asia	biennial plant
	63 파초	芭蕉	*Musa basjoo*	China	Perennial plant
	64 수선화	水仙	*Narcissus tazetta var. chinensis*	China	Perennial plant
	65 연	蓮	*Nelumbo nucifera*	India, Chir	Perennial plant
	66 작약	芍藥	*Paeonia lactiflora*	China	Perennial plant
	68 양귀비	櫻粟	*Papaver somniferum*	Mediterra	annual plant
	71 나팔꽃	纏支牧丹	*Pharbitis nil*	China	annual plant
	72 대나무	竹	*Phyllostachys spec.*	Korea	Perennial plant
	93 길상초	吉祥草	*Reineckia carnea*	China	Perennial plant
	105 조릿대	山竹	*Sasa borealis*	Korea	Perennial plant
	106 취운초	翠雲草	*Selaginella uncinata*	China	Perennial plant
	115 한련	旱蓮	*Tropaeolum majus*	South Am	annual plant
	121 백일홍	百日紅	*Zinnia elegans*	Mexico	annual plant

Symbolism of Plants for Traditional Landscape Architecture

In the planting and cultivation of plants for landscape architecture, the ancients did not overlook any plant or tree, or even its roots as trivial, but thought of it as a property of reason. Granting symbolism, sublimated plants metaphysically and made them as a rule of living to be like them. Plants were companions. This fact is well shown in that they granted grace to or graded ranks of the plants for landscape architecture and called them as friends or guests[35]..

[35] "더우면 꽃피고 추우면 잎 지거늘 솔아 너는 어찌 눈서리를 모르느냐 구천에 뿌리 곧은 줄을

In the era of Joseon, the theory of configuration of the ground (風水), the thought of Yin-Yang and the Five Elements (陰陽五行), Taoism, the thought of Taoist hermit with supernatural powers (道敎思想), Buddhism, Confucianism, shamanist custom religion became the background of thoughts, and the place, direction and shape of planting of trees relates to such thought, to which the ecological characteristics of trees were immanent. At last, the aesthetic, functional and ecological aspects and the symbolism granted to the plants were considered together when selecting plants. That is, the symbolism of plants for landscape architecture was a very important element in the Joseon era when planting in a garden[36].

In the representation of vegetation landscape of private retreats, it will be a more faithful representation to conduct the planting of inner gardens following the thought of Joseon era on planting and the fairness or avoidance of planting (配植宜忌) based on the symbolism of plants for landscape architecture. In this study, the symbolical meanings of the plants in Joeseon era of 80 species or more were found including symbolical meanings of the representative traditional species known in general. And the symbolical meanings and the references of new found symbolism are shown in the table 2.2.

The scope of symbol of the examined plants for traditional landscape architecture can be largely divided into 3 kinds: 1)Confucianist ideal, 2)Taoist view of afterlife and 3)the prayer for good fortune or warding off evil in this world. This was also the social and cultural view of the world that dominated the era of Joseon. Some plants have meanings in more than one kind of symbolism. There were, for example, some species of trees with both Confucianist and Taoist symbols. The peach tree(Prunus persica) symbolized the lecture halls of Confucius in the Confucianist aspect and also the

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그로 하여 아노라". Gosan Yun Sun-Do(孤山 尹善道, 1587-1671) appreciated the fidelity of five representative plants and called them as five friends in his poem, 五友歌.

[36] The Overview of Traditional Planting, www. nhc. go. kr/natural/info/report, p.20

paradise, the Taoist Utopia. The Chinese Parasol tree(*Firmiana simplex*) carried a symbolic meaning for this world and in Toism at the same time.

The symbolical meaning of plant for landscape architecture was an important criteria to decide where to plant and what kind of trees in a garden. It is because the principle of fairness or avoidance of planting (配植宜忌) was based on the symbolism.

<Table 2.2 Classification of the Plants for Traditional Landscape Architecture Following Symbolism>

Confucianist Ideal

Korean name	Old name	Scientific name	Traditional Symbolic Meaning
2 단풍나무	丹楓	*Acer spp.*	virtue, merit
14 동백나무	山茶花	*Camellia japonica*	purity, unyeilding spirit,prosperity
25 국화	菊	*Chrysanthemum spp.*	unyeilding spirit of scholar, hermit
29 난(보춘화)	蘭	*Cymbidium spp.*	fidelity
39 은행나무	銀杏	*Ginkgo biloba*	Congfucius(scholar)
56 광나무	女貞	*Ligustrum japonicum*	fidelity, unyeilding spirit
67 연	蓮	*Nelumbo nucifera*	nobility, paradise, purity
74 대나무	竹	*Phyllostachys spec.*	unyeilding spirit, constancy
75 소나무	松	*Pinus densiflora*	unyeilding spirit, constancy, purification
76 잣나무	栢	*Pinus koraiensis*	unyeilding spirit,eternal life(royal tomb, palace)
77 해송(곰솔)	海松	*Pinus thunbergii*	unyeilding spirit, constancy, purification
81 옥매	玉梅	*Prunus glandulosa*	unyeilding spirit of scholar, hermit/ nobility, hope
83 매화나무	梅	*Prunus mume*	unyeilding spirit of scholar, hermit/ nobility, hope
84 복숭아나무	桃	*Prunus persica*	spirit of scholar,longevity, paradise, beauty
85 자두나무	李	*Prunus salicina*	spirit of scholar,longevity, paradise, beauty
109 회화나무	槐	*Sophora japonica*	scholar, nobility, royalty
115 측백나무	柏	*Thuja orientalis*	scholar, prosperity
116 비자나무	榧子	*Torreya nucifera*	scholar
122 느티나무	槐	*Zelkova serrata*	scholar, nobility, royalty

Taoist Ideal

Korean name	Old name	Scientific name	Traditional Symbolic Meaning
1 전나무	檜	*Abies holophylla*	eternal life(royal tomb, palace)
3 석창포	石菖蒲	*Acorus gramineus*	purity
7 오리나무	赤楊	*Alnus japonica*	practical purpose(tomb)
12 박달나무	檀	*Betula schmidtii*	holiness, practical purpose
14 동백나무	山茶花	*Camellia japonica*	purity, unyeilding spirit,prosperity
25 국화	菊	*Chrysanthemum spp.*	unyeilding spirit of scholar, hermit
26 귤나무(유자)	橘 (柚子)	*Citrus unshiu*	tasteful atmosphere,fortune
30 서향	瑞香	*Daphne odora*	tasteful atmosphere, good friend
31 패랭이꽃	石竹	*Dianthus chinensis*	innocence
37 벽오동	梧	*Firmiana simplex*	peace and prosperity, hope
38 치자나무	梔子	*Gardenia jasminoides for. grandiflora*	purity, elegance
42 무궁화	槿	*Hibiscus syriacus*	Korea, eternity, beauty
44 옥잠화	玉簪花	*Hosta plantaginea*	innocence
49 황매(영춘화)	黃梅	*Jasminum nudiflorum*	hope
50 가래나무	楸	*Juglans mandshurica*	eternal life(royal tomb, palace)
52 향나무	檜柏	*Juniperus chinensis*	purification(tomb, temple),eternal life(royal tomb, pala
58 동자꽃	翦春(秋)羅	*Lychnis cognata*	innocence
67 연	蓮	*Nelumbo nucifera*	nobility, paradise, purity
75 소나무	松	*Pinus densiflora*	unyeilding spirit, constancy, purification
76 잣나무	栢	*Pinus koraiensis*	unyeilding spirit,eternal life(royal tomb, palace)
77 해송(곰솔)	海松	*Pinus thunbergii*	unyeilding spirit, constancy, purification
81 옥매	玉梅	*Prunus glandulosa*	unyeilding spirit of scholar, hermit/ nobility, hope
83 매화나무	梅	*Prunus mume*	unyeilding spirit of scholar, hermit/ nobility, hope
84 복숭아나무	桃	*Prunus persica*	spirit of scholar,longevity, paradise, beauty
85 자두나무	李	*Prunus salicina*	spirit of scholar,longevity, paradise, beauty
89 배나무	梨	*Pyrus spp.*	elegance,fortune
95 길상초	吉祥草	*Reineckia carnea*	fortune
101 월계화	四季花	*Rosa chinensis*	purrity, holiness
102 장미	薔薇	*Rosa hybrida*	beautiful friend
103 해당화	海棠花,玫瑰	*Rosa rugosa*	purity, prosperity
110 조팝나무	繡線菊	*Spiraea prunifolia*	piety
111 정향나무	丁香	*Syringa velutina*	innocence, simplicity
113 주목	赤木	*Taxus cuspidata*	eternal life(살아천년 죽어서도 천년)
114 차나무	茶	*Thea sinensis*	practical purpose, purification

Secular Prayer for Goodness

No.	Korean name	Old name	Scientific name	Traditional Symbolic Meaning
6	자귀나무	夜合樹	*Albizia julibrissin*	love
8	접시꽃	蜀葵	*Althaea rosea*	promotion, royalty, prosperity
14	동백나무	山茶花	*Camellia japonica*	purity, unyeilding spirit,prosperity
17	밤나무	栗	*Castanea crenata*	prosperity, fertility, precious fruit
19	맨드라미	鷄冠花	*Celosia cristata*	amulet
23	모과나무	木瓜	*Chaenomeles sinensis*	precious fruit,prematurity
32	감나무	柿	*Diospyros kaki*	prosperity ,precious fruit
37	벽오동	梧	*Firmiana simplex*	peace and prosperity, hope
40	해바라기	秋葵(葵花)	*Helianthus annuus*	promotion, royalty, prosperity
41	원추리	萱	*Hemerocallis fulva*	fertilty
42	무궁화	槿	*Hibiscus syriacus*	Korea, eternity, beauty
46	봉선화	鳳仙	*Impatiens balsamina*	amulet
54	음나무(엄나무)	嚴木	*Kalopanax pictus*	amulet, medical purpose
55	배롱나무	紫薇花	*Lagerstroemia indica*	wealth and honor, beauty
59	목련	木蓮	*Magnolia denudata*	beauty
63	뽕나무	桑	*Morus alba*	love
64	산뽕나무	柘	*Morus bombycis*	practical purpose, love
65	파초	芭蕉	*Musa basjoo*	promotion, prosperity
68	작약	芍藥	*Paeonia lactiflora*	wealth and honor, beauty
69	모란	牧丹	*Paeonia suffruticosa*	wealth and honor, beauty
80	살구나무	杏	*Prunus armeniaca*	prosperity, beauty
88	석류나무	石榴	*Punica granatum*	fertility, prosperity
95	길상초	吉祥草	*Reineckia carnea*	fortune
96	왜철쭉	日本 躑躅	*Rhododendron indicum*	prosperity, beauty
97	진달래	杜鵑花	*Rhododendron mucronulatum*	prosperity, beauty
98	철쭉	躑躅	*Rhododendron schlippenbachii*	prosperity, beauty
99	참꽃나무(영산홍	映山紅	*Rhododendron weyrichii*	prosperity, beauty
102	장미	薔薇	*Rosa hybrida*	beautiful friend
103	해당화	海棠花,玫瑰	*Rosa rugosa*	purity, prosperity
104	버드나무(왕버들	楊柳	*Salix chaenomeloides*	beauty, spring, farewell
105	버드나무	楊柳	*Salix koreensis*	beauty, spring, farewell
106	버드나무(능수버	楊柳	*Salix pseudolasiogyne*	beauty, spring, farewell
119	산앵도	山櫻	*Vaccinium koreanum*	precious fruit, love
120	포도나무	葡萄	*Vitis vinitera*	fertility, prosperity
121	등나무	藤	*Wisteria floribunda*	love
124	대추나무	棗	*Zizyphus jujuba*	prosperity, fertility, precious fruit

Referances: As belows are the newly found symbolic meanings of the plants for landscape architecture and those references in this study.

Yanghwasorok(養花小錄): No.30, 52

Hwaamsurok(花菴隋錄): No.26, 32, 42, 55, 59, 88, 89, 96, 102, 103, 111

Korean Culture in flowering(Sanghee Lee, Nexus 2004): No.1, 12, 14, 49, 97, 99, 104, 105, 106

Study on Planting in Korean Traditional Landscape Architecture(Sun Yee, Suryusanbang 2006): No.39, 50, 76, 109, 116, 119, 122

Tree Culture in Korea(Hongsun Song, Seoul: Munyaesanchaek 1996): No.121, 124

Encyclopedia of Korean Ethnic Culture(http://encykorea.aks.ac.kr/): No.6, 54

National Heritage Center(www. nhc. go. kr/natural/info/report): No.37, 68, 80, 84, 85

Traditional Fairness or Avoidance of Planting of Plants for Traditional Landscape Architecture(配植宜忌): 'Right Tree in Right Place'(適地適樹)

The ancients did not plant any tree thoughtlessly when forming the landscape space. They grasped the ecological characteristics of plants and discriminately planted tolerant trees and intolerant trees, and decided the places for planting following the species of trees and purpose of planting. The guidance of right tree in right places to grasp the physiology and ecology of trees well and to thereby plant them in proper places was called the fairness or avoidance of planting(配植宜忌).

This fairness or avoidance of planting presents the places and directions for planting plants, and this was decided on the basis of the physiological properties of trees, the environmental changes in location after planting, whether the scene is beautiful or not and the symbolical meaning of the plants[38].

This fairness or avoidance of planting is introduced in Bokgeo(卜居) and Taekmokjapgi(擇木雜記) parts of Sanrimkyongjae(山林經濟), Yanghwasorok(養花小錄), Imwonsibyukji(林園十六志) and so on, and this study excluded the contents on good or ill luck of building site based on the theory of configuration of the ground, and examined only the contents on plants for landscape architecture.

The fairness or avoidance of planting suggests proper plant species and its planting spot with a house as a center (see Table 2.3, 2.4). The fairness or avoidance of planting about planting spot are mainly related to brightness and ventilation in house for helthy and comfortable life. And the fairness or avoidance of planting about direction are mainly related to shade-tolerence of trees. Most of the fairness or avoidance of planting are considering both ecological and symbolical aspects of plants, it is because the symbolical meaning of plants involve both of functional and ecological characteristic of plants.

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[38] Sun Yee, *op. cit.*, pp. 571

In the case of planting spot, within courtyarrd, planting flowers were prefered rather than tall trees for ventilation and well-sunshined. If a tall, big tree is planted in courtyard, 1)the brightness and ventilation of house would be worsed, 2)the possibility of damaging the house in rainy, stormy season by falling down would be increased, 3) cutting-off the branches would be forbiddened according to sprit of the big tree worship, and 4) deep root would make problems to house. And the belief that planting a tree in courtyard is shown as chinese character '困' meaning poverty made to avoid planting within courtyard.

In the case of planting direction, bamboo was suggested to be planted northward around the house for auspicious thing in terms of Pung su.[39] In Korea, wind is blowing from northwest in winter, but strong sunlight is from northwest in summer. Therefore, planting for windbreak and sunlight shielding should be needed. Bamboo was considered as a proper planting material for windbreak and sunlight shielding because it is a shade-tolerant tree and quickly propagates by root suckers in backyard.

These shows the ancesters fully understood the ecological characteristic of plants and the symbolism of plants is also deeply related to the understanding. That is, the fairness or avoidance of planting is based on the ecological thinking that makes both house and garden developed sustainably.

[39] 'Taekmokjapgi' part of Sanlimkyungjae

<Table 2.3 The Fairness and Avoidance of Planting according to Planting spot>[41]

Place	Fairness(宜) Avoidance(忌)	Species(Symbolism)	Basis(Reason)
Front door	宜	*Sophora japonica*(prosperity), *Zizyphus jujuba*(prosperity), *Salix koreensis*(prosperity)	Symbolism
	忌	*Salix pseudolasiogyne*(farewell), Withering tree, Two trees opposite to each other, Evergreen trees	Symbolism, Scenic beauty
Courtyard (中庭)	宜	Flowers and grasses, Small flowering trees	Scenic beauty, Condition of location
	忌	Big tree(困)	Symbolism, Scenic beauty, **Condition of location** (Brighteness and ventilation, possibility of falling down)
Front of garden (庭前)	宜	*Punica granatum*(fertility), *Daphne odora*(good friend)	Symbolism
	忌	*Firmiana simplex* (home of Phoenix), *Musa basjoo*	Symbolism, **Condition of location** (Brightness/ *Musa basjoo* –water-tolerance)
Along the fence	宜	*Chrysanthemum spp*. (fidelity)	Symbolism, Scenic beauty, **Physioecological basis**(Directivity for sunshine)
	忌	*Cedrela sinensis*, *Zanthoxylum schinifolium*, *Euonymus fortunei* var. *radicans*	**Condition of location**
Beside the well	宜		
	忌	*Prunus persica*	**Physioecological basis**(Prevention of contamination by harful insects)
Around house	宜	*Pinus densiflora* forest(fidelity, unyielding spirit), *Phyllostachys spec.* forest(fidelity, unyielding spirit)	**Symbolism, Condition of location** (Windbreak and shielding)
	忌	*Acer spp.*, *Populus davidiana*, *Ailanthus altissima*	Symbolism, **Physioecological basis**(Impossibility of windbreak after falling leaves)
In house (宅內)	宜		
	忌	*Hibiscus syriacus*, *Morus alba*, Evergreen trees	Symbolism, **Physioecological basis(***Hibiscus syriacus*, *Morus alba*-frequent occurrence of harmful insects)

[41] Re-edited the tables in Sun ,Yee(*op. cit.*, pp.574-575) and added symbolisms,detailed basis using references of Byun(1976) and Kim(2008)

<Table 2.4 The Fairness and Avoidance of Planting according to Planting Direction >[42]

Direction	Fairness(宜) Avoidance(忌)	Species(Symbolism)	Basis(Reason)
East	宜	*Prunus persica*(longevity,paradise), *Salix koreensis*(compensation in Punsu theory)/ *Firmiana simplex* (prosperity), *Prunus salicina* (longevity,paradise)	Symbolism, Scenic beauty
	忌	*Prunus armeniaca*	
Southeast	宜	*Rhus verniciflura*, *Salix koreensis*	
	忌	*Prunus armeniaca*	
South	宜	*Prunus mume*(hermit, fidelity), *Zizyphus jujuba* (compensation in Punsu theory) / *Prunus persica* (longevity,paradise)	Symbolism, **Physioecological basis(** *Prunus mume*, *Zizyphus jujuba* –shade-intolerence)
	忌	*Prunus salicina*	
Southwest	宜		
	忌	Big Tree	**Condition of location** (ventilation)
West	宜	*Gardenia jasminoides for. grandiflora*(elegance,purity), *Ulmus davidiana*(compensation in Punsu theory)/ *Zizyphus jujuba* (prosperity,fertility), *Morus bombycis*	Symbolism, **Physioecological basis(***Ulmus davidiana*-making shade by wide spread branches)
	忌	*Salix koreensis*, *Prunus salicina*, *Prunus persica*	
Northwest	宜	*Phyllostachys spec.* (fidelity), *Paulownia coreana*, Big Tree	**Condition of location** (windbreak and shielding)
	忌		
North	宜	*Prunus serrulata*, *Prunus armeniaca* (compensation in Punsu theory)/ *Ulmus davidiana*, *Corylus heterophylla*, *Rhododendron mucronulatum* (prosperity)	Symbolism, **Physioecological basis**(*Rhododendron indicum* - strong shade-tolerence, *Ulmus davidiana*, *Corylus heterophylla*- windbreak and shielding)
Northeast	忌	*Prunus salicina*, *Camellia japonica*, *Rhododendron weyrichii*, *Rhododendron indicum*, *Gardenia jasminoides for. grandiflora*, *Punica granatum*, *Rosa chinensis*	**Physioecological basis** (weak cold-resistance)
	宜	*Phyllostachys spec.* (fidelity)	Symbolism, **Physioecological basis(**strong shade-tolerence**,** windbreak and shielding**)**
	忌	Big Tree	

[42] Re-edited the tables in Sun ,Yee(*op. cit.*, pp.574-575) and added symbolisms,detailed basis using references of Byun(1976) and Kim(2008)

III. The Landscape of Traditional Private Retreats Analyzed as Habitats of Natural Vegetation

Traditionally, the beginning of construction of private retreats is to select the location in a picturesque place with beautiful natural vegetation landscape. Automatically, they came to have an outstanding vegetation landscape in the surrounding scenes in the back and the areas of outer gardens. Along with that, in the area of inner gardens, single planting(單植), opposite planting(對植) and three-spot planting(三點植材) were conducted following the traditional planting techniques for the trees and flowering plants with symbolic meaning, but multi layered planting was conducted in three dimensions excluding the cases of single planting or liner planting so that they will look like the appearance of natural vegetation[43]. Thus the overall vegetation landscape of private retreats come to direct beautiful vegetation landscape by assimilating with the natural vegetation.

In view of the existing historical private retreats, the natural vegetation as the background scenery has a tendency to be maintained well in general excluding the cases of incorporation in the downtown such as Seokpajeong or Seongragwon. This is possible because many private retreats took root in picturesque places with excellent natural scenes from the beginning. However, there are some places discovered in which the present condition of planting in the areas of outer and inner gardens is different from the original planting of private retreats. This is due to the reckless planting of those that are not the plants for traditional landscape architecture (for example, *Pinus rigida*, *Chamaecyparis obtusa*) when newly planting in the later generations as in the example of Damyang Soswaewon[44]. The

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[43] Sun Yee, *op. cit.*, pp.562-564

[44] Dongoh Jung, "the Plants for Landscape Architecture in Soswaewon", *Culture Study of Honam*, Vol. 9, 1977, p. 150

introduction of foreign plants for landscape architecture without traditionality can be easily found in not only the byeolseo private retreats but also the changes in planting of Lu such as the Changdeok Palace or the poor management of vegetation landscape of Suwon Hwaseong[45], which is a world heritage. Careless planting harms the traditional vegetation landscape of the existing historical private retreats.

The plants for landscape architecture are also organisms and thus it is natural for them to have the limitedness of life, but, when planting or replanting trees in traditional spaces including byeolseo private retreats, one should select the species of trees by considering not only the ecological characteristics of trees but also the symbolical characteristics of the places.

To represent vegetation landscape of private retreat, the plants for landscape architecture to be used for the planting should not be a foreign species that will harm the traditional vegetation landscape nor a plant not in harmony ecologically or symbolically. Those meeting these requirements are the species of plants that have been used as plants for landscape architecture traditionally.

And the other requirement for representation of vegetation landscape of private retreat is to know what types of landscape have been private retreats traditionally. Because the adaptability of plants species would be different following the environmental condition of its location such as climate, soil and water, it is imporatant to know the location type to determine the proper plants for landscape architecture on the site.

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[45] Haeyong Shim, Management Plan of Vegetation Landscape in Paldal Park, World Culture Heritage Hwasung, Suwon, Korea, Unpublished Master Dissertation (University of Seoul, 2010), pp.19-20 Shim pointed out that since the designation of Hwaseong as world heritage, many remains are being recovered in the architectural aspect, but the interest in the surrounding scenes, which are the background of remains, is insufficient and the management of natural vegetation is inadequate, and thus it is needed to manage the vegetation landscape in harmony with historical and cultural resources as world heritage.

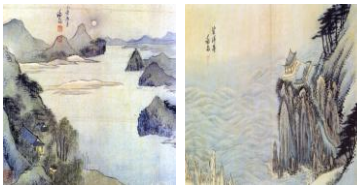
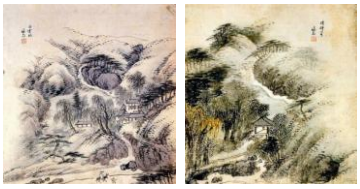
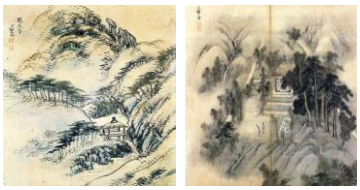
3.1 Landscape types of Private Retreats

The landscape types following the location of the existing historical private retreats are divided into 4 types in general[46]. They are classified largely into the waterfront type (臨水型) and the inland type (內陸型) following the degree of vicinity of large-scale water spaces (large stream, river, sea), and the waterfront type is divided into the type near to water(臨水隣接型) and the type near to stream of water(臨水溪流隣接型) following whether the large-scale water space is directly near the gardens or not. Meanwhile, the inland type can be divided into the type of mountainous district(山地型) and the type of low slope area (平地型) following whether it is in or near to the mountainous district.(see Table 3.1)

The large-scale spaces are a great standard in selecting the location of private retreats, and this seems to be based on the theory of configuration of the ground(風水) attaching importance to turning the back on mountains and waterfront. In case of the waterfront type, there were many examples with location looking down on a river or a coast by deciding the location where view is possible in order to draw the distant view, and it was the most preferred location of Lu and Jung. In case of the inland type, for example, Soswaewon and Namganjungsa, it can be seen that there are many cases that form the scenes in an atmosphere of more seclusion focusing on the artificial water scene spaces such as rectangular-shaped pond.

[46] The Association of Korean Traditional Landscape Architecture, *op. cit.*, p.262

<Table 3.1 Landscape Types of the Representative Exsisting Private Retreats>[47]

Landscape types		Example Landscapes in Old Drawings	Examples of Exisisting Private retreats
Waterfront Type (臨水型)	臨水引接型 (River, Coast)		Amseojae in Goisan, Indaejung in Hwasoon, Choganjung in Gosung, Dokrakdang in Kyungju
	臨水溪流引接型 (Near to Stream)		Buyongdong in Bogildo, Sohanjung in Yangsan, Yunjung in Youngcheon, Myungokhun in Damyang, Dasanchodang in Gangjin, Geoyunjung in Hamyang, Yongamjung in Geochang, Soswaewon in Damyang
Inland Type (內陸型)	山地型 (Mountainous)		Seokpajung in Seoul, Buamjung in Seoul, Sungrakwon in Seoul, Okryugak in Daejeon
	平地型 (Low slope area near to mountain)		Namganjeongsa in Daejeon, Seoseokji in Youngyang, Bangchojung in Geumreung, Yulhwajung in Bosung

3.2 The Relationship between Natural Vegetation Structure and the Landscape

Any landscape can develop a typical natural vegetation and will have a typical set of plant communities. The natural vegetation structure gives therefore clues to select proper plants for

[47] Old Drawings are landscape painting works of Gyumjae Jungsun(謙齋 鄭敾, 1676-1759), a landscape painter in mid- Joseon era using realistic depicting technique.

developing landscape architecture for a private retreat by landscape type. Therefore, in this study, natural vegetation should be determined if we want to find proper plants for landscape architecture of a private retreat.

The green clothes covering the earth are called 'vegetation'(植生), and vegetation is made of numerous societies of plants. The plant community(植物群落) is a collection of plant species within a designated geographical unit, which forms a relatively uniform patch, distinguishable from neighboring patches of different vegetation types. The components of each plant community are influenced by soil type, topography, climate and human disturbance.[48]

The plant community maintains a continuous correlation with each other while having a unique species composition(種組成), and show a distinct difference in the functions and structures following environmental factors. The plant community contains the ecological information on location, and as a result, they are observed as the current species composition, a structured set of species. That is, the set of species contains all the diverse ecological environmental information such as climate, tophography in the field of location.[49]

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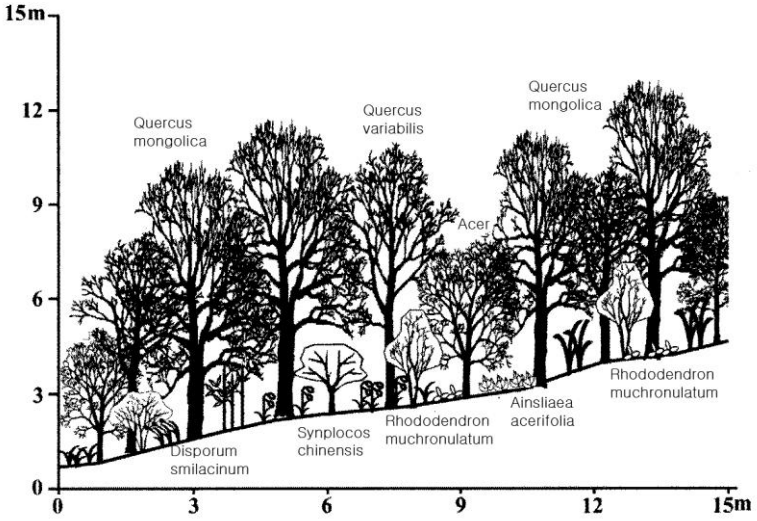
[48] Wikipedia, http://en.wikipedia.org/wiki/Plant_community(searching date: May 30, 2012)

[49] Jongwon Kim, *Vegetation Ecology* (Seoul: World Science,2006), pp.104-107



<Figure 3.1 Cross-sectional Diagram of Quercus mongolica-Quercus variabilis community in hillside>[50]

3.3 Habitat Types of Set of Species by Landscape types

Natural Environment of Korea

Up until now many studies have proved that the natural environment had the greatest impact on the formation of the culture of traditional landscape architecture of Korea. Korea is located at the end of the Asian Continent geographically, and is a peninsula country with longer distance from South to North than that from East to West, and the eastern part is higher than the western part. The annual average rainfall is relatively much at 1200mm, with parts that have below 600 or over 2000mm. The horizontal distribution of plants following the difference in latitude is various because of the topographical condition of peninsula which is long from South to North. In the northern region, most forests are coniferous forests, and the middle regions have deciduous broad-leaved forests. In addition, the main species of the southern and seaside regions are evergreen broad-leaved forests.

[50] National Institute of Environmental Research, *Ibid.* , Edited the diagram in p. 5

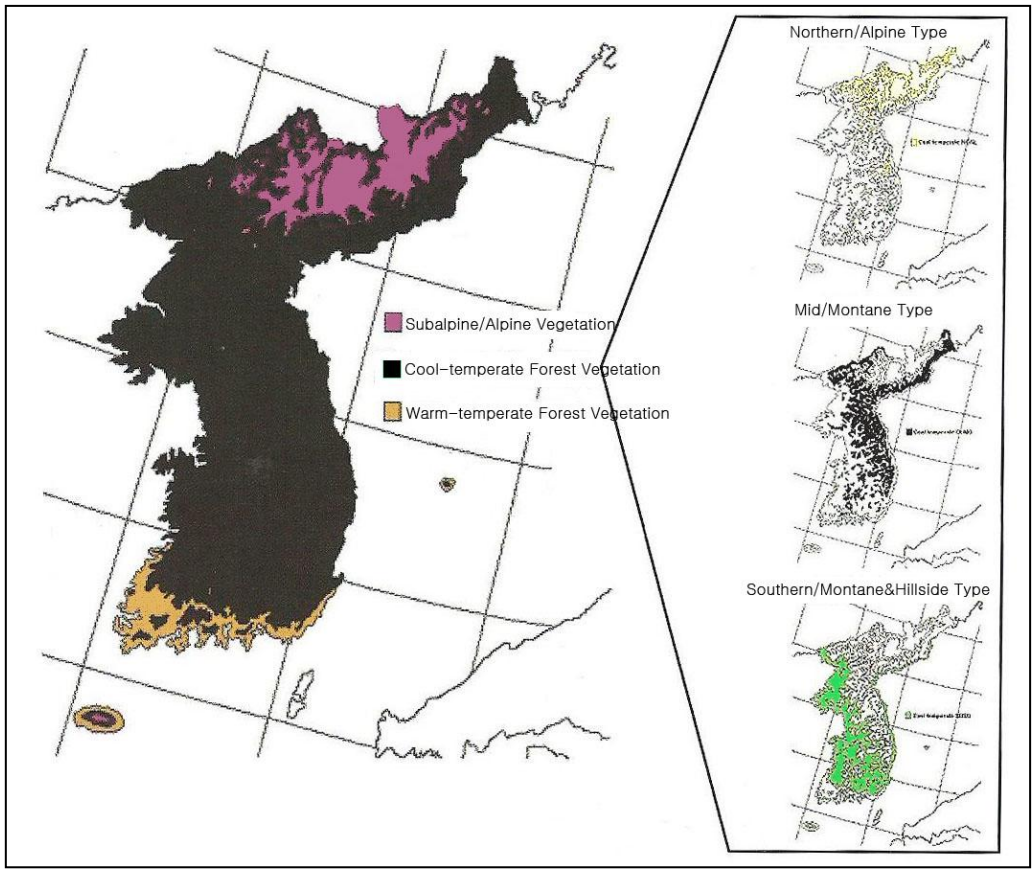
Chracteristics of the Forest Vegetation of Korean Penninsula[51]

The forest vegetation of Korean peninsula is characterized by 'Cool-temperate Deciduous Broad-leaved Forest'. In general, *Quercus spp*. and *Acer spp.* are representative species which form the cool-temperate deciduous broadleaved forest.

The *Quercus spp.* forest of Korea is consisted of *Quercus mongolica, Quercus serrata, Quercus variabilis,Quercus accutissim, Quercus dentaat, Quercus aliena* and other hybrid species of them. This is completely distinguishable charateristic of Korean forest vegetation different with Japanese, North American and Cetral European temperate forest which is consisted of *Fagus spp.* and *Quercus spp.*

The forest vegetation of Korean peninsula belongs to 'Korean Peninsula subtype' under 'Continental type' in vegetation geography. The 40% of plant species are trees and *Quercus mongolica, Quercus serrata, Quercus variabilis,Carpinus laxiflora, Carpinus tschonoskii, Carpinus cordata, Magnolia sieboldii, Acerspeudosieboldianum, Rhododendron schlippenbachii, Symplocos chinensis* and *Ainsliaea acerifolia* are 'diagnostic species' different with other vegetation type.(see Figure 3.2)

[51] Jonwon Kim, *op. cit*., pp. 62-74



<Figure 3.2 Classification of Vegetation(Top) and Potential Vegetation(Bottom) of Korean Penninsula>[52]

[52] Jongwon Kim, *Ibid*.. Edited and remade the figures in p.70.

Classification of Vegetation by Landscape types

< Table 3.2 Classification of Vegetation following Habitat Types by Landscape types >[53]

<table>
<tr><th colspan="2">Landscape types</th><th>Formation</th><th colspan="2">Physiognomy
(植物群落相)</th><th>Representative Examples of Plants community</th></tr>
<tr><td rowspan="6">Waterfront Type
(臨水型)</td><td rowspan="4">臨水引接型
(River, Coast)</td><td rowspan="2">Wetland Vegetation</td><td colspan="2">Riparian Forest</td><td>Salix koreensis community,</td></tr>
<tr><td colspan="2">Riparian Cliff Forest</td><td>Koelreuteria paniculata-Hemitelea davidii community, Ulmus parvifolia community</td></tr>
<tr><td rowspan="2">Coastal Vegetation</td><td colspan="2">Annual plants Communities on Coastal Cliff</td><td>Sagina maxima community</td></tr>
<tr><td colspan="2">Coastal Cliff Forest</td><td>Pinus thunbergii community</td></tr>
<tr><td rowspan="2">臨水溪流引接型
(Near to Stream or Pond)</td><td rowspan="2">Wetland Vegetation</td><td colspan="2">Swamp Forest</td><td>Alnus japonica community, Salix chaenomeloides community</td></tr>
<tr><td colspan="2">Ravine Forest</td><td>Fraxinus mandshurica community, Zelkova serrata-Orixa japonica community</td></tr>
<tr><td rowspan="8">Inland Type
(内陸型)</td><td rowspan="5">山地型
(Mountainous)</td><td rowspan="3">Cool-temperate Montane & Hillside Vegetation</td><td colspan="2">Cool-temperate Mixed Forest (northern/subalpine)</td><td>Quercus mongolica-Pinus koreensis community</td></tr>
<tr><td rowspan="3">Cool-temperate Deciduous Broadleaved Forest</td><td>Mid/montane</td><td>Quercus mongolica-Sasa borealis community</td></tr>
<tr><td>Southern/hillside</td><td>Quercus serrata community, Quercus aliena-Orixa japonica community</td></tr>
<tr><td>Ravine</td><td>Fraxinus mandshurica community, Zelkova serrata-Orixa japonica community</td></tr>
<tr><td rowspan="2">Warm-temperate Broad-leaved Forest</td><td colspan="2">Warm-temperate Evergreen Broad-leaved Forest</td><td>Persea thunbergii community</td></tr>
<tr><td colspan="2">Warm-temperate Deciduous Broad-leaved Forest</td><td>Zelkova serrata- Orixa japonica community</td></tr>
<tr><td rowspan="4">平地型
(Low slope area near to mountain)</td><td rowspan="2">Cool-temperate Montane & Hillside Vegetation</td><td rowspan="2">Cool-temperate Deciduous Broadleaved Forest</td><td>Mid/montane</td><td>Quercus mongolica-Sasa borealis community</td></tr>
<tr><td>Southern/hillside</td><td>Quercus serrata community, Quercus aliena-Orixa japonica community</td></tr>
<tr><td rowspan="2">Warm-temperate Broad-leaved Forest</td><td colspan="2">Warm-temperate Evergreen Broad-leaved Forest</td><td>Persea thunbergii community</td></tr>
<tr><td colspan="2">Warm-temperate Deciduous Broad-leaved Forest</td><td>Zelkova serrata-Orixa japonica community</td></tr>
</table>

[53] Refered and remade the <table 2> in the 3rd National Institute of Environmental Research, the Guidelines of the 3rd Nationwide Natural Environmental Research(vegetation), 2007, pp.19-23

The forest vegetation of Korean peninsula is classified into 12 formations by natural condition of habitat and the formations are classified again into 49 physiognomy(植物群落相) on which hunam distaurbance is reflected. Among these formations and physiognomies, several ones which are applicable to landscape types of private retreat are selected in this study. (see Table 3.2)

In a case of inland type landscape, the formations following habitat type are determined as cool-temperate Montane & Hillside Vegetation and Warm-temperate Broad-leaved Forest. It seems to be reasonable because the forest vegetation of Korean peninsula is characterized by 'Cool-temperate Deciduous Broad-leaved Forest' as said in the above. And in a case of low slope area landscape, cool-temperate Mixed Forest(subalpine area) and ravine forest(near to stream) were excluded from the physiognomies because those are unrelated to the low slope area.

Under this classification of vegetation following habitat types by landscape types, ecologically proper species composition of plants for landscape architecture by landscape types could be find out through refering the natural vegetation structure analysis data which are collected following the landscape types.

IV. Ecological Species Combination of Plants for Traditional Landscape Architecture

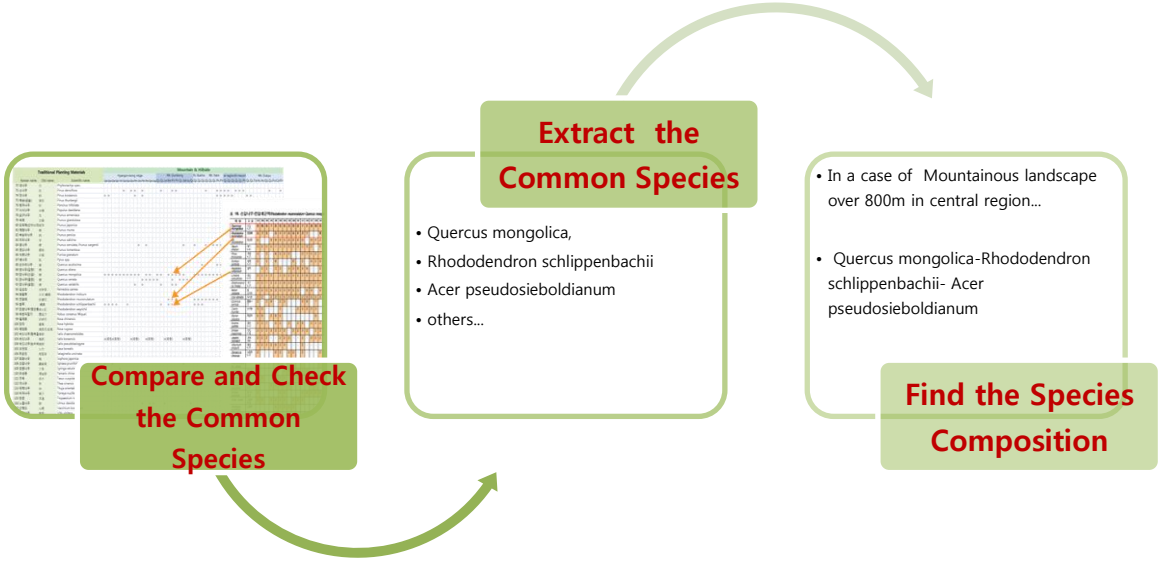
When building a traditional gardens representing an private retreat, it seems to be possible to achieve a traditional vegetation landscape if one uses and plants the plants for traditional landscape architecture examined before. It even seems that one can improve the poor vegetation landscape of the site. However, if one plants at random by choosing something just because it is a plant for traditional landscape architecture, it may be impossible to maintain a vegetation landscape which is ecologically sustainable. It will never resemble the natural vegetation such as found as background scenery and in outer gardens of the original private retreats. This is because there are ecological associations between plants also in landscape architecture. It means that phytosociological consideration is needed also for planting design of traditional gardens.

4.1 Examining Method for Plants Species Compositions

This study aims to find the combination of species of plants that are mutually harmonious among the species of trees for traditional landscape architecture by landscape types. For this purpose, this study collected the analysis data of natural vegetation proper for each type of landscape and compared them with the list of traditional plant for landscape architecture as shown table 2.1.

The natural vegetation analysis data show that sets of plants point to phytosociological relations that can be seen as indicating ecological potential. When planning an private retreat, such phytosociological relation should be a reference for designing with plants.

The method starts with collecting data of the plant communities in natural vegetations for each landscape type (waterfront type, inland type, etc.). Plant communities consist of many species, among which we find again many that were used, planted, or enjoyed traditionally as plant in and around the private retreat (these are the plants listed in table 2.1). Checking with common species, correlations could be find, extracting groups of plants that belong to one and the same plant community. It results in a list of natural vegetations in landscapes that were preferred to locate a private retreat. Figure 4.1 shows a flow chart of this method. The following pages apply the method for each landscape type.



<Figure 4.1 Flow Chart of Examinng Method for Plant Speces Composition>

To find out proper plant species composition for waterfront type(臨水型) private retreat, this study referred to river vegetation of the five rivers of Korea (Han River, Geum River, Youngsan River, Nakdong River and Seomjin River) for vegetation of rivers and valleys and coast vegetation of the southern, eastern and western coasts for the vegetation of coasts. And for inland type(內陸型) private retreat, this study referred to research of natural vegetation in 6 mountains in the middle inland, Gangwon Hyangnobong and Geonbong Mountain that show the vegetation of subalpine zone of the

Korean peninsula and Deogyu Mountain in the middle-southern inland. Because the more pure natural vegetation show the more ecologically affinitiive species, this study collected the pure natural vegetation structure analysis data which have been rarely disturbed by human, and the data which have a range of nationawide.

Finally, to use the result as the vegetation or phytosociological background that forms a reference to plant design of private retreat, this study also shows representative plant community names including the common plant species composition by landscape types. Besides, to help to refer another natural plant species of the representative communities, this study also shows another companion species which are not the Plants for Traditional landscape architecture

As a result, 50 species of trees traditionally used are found within the sets of species of natural vegetation communities. Among these, there were 26 species of tall trees, 20 species of shrubs used in traditionally in gardens and 4 species of flowering plants. There were not many flowering plants and shrubs (especially flower plants) that come up in plant communities lists. The reason seems to be that flowering plants in traditional landscape architecture were planted focusing on enjoying. They were brought along and did not exist as spontaneous plants fitting the natural vegetation communities in Korea.

4.2 Wetland Vegetation in Waterfront Type Landscape

Landscape Types		Habitat Types of Set of Species	Physiognomy (植物群落相)
Waterfront Type (臨水型)	臨水引接型 (River, Coast)	Wetland Vegetation	Riparian Forest
			Riparian Cliff Forest
		Coastal Vegetation	Annual plants Communities on Coastal Cliff
			Coastal Cliff Forest
	臨水溪流引接型 (Near to Streamor Pond)	Wetland Vegetation	Swamp Forest
			Ravine Forest

<Figure 4.2 Analyzed Sites of Collected Natural Vegetation Structure Analysis data(left) and Habitat Types following the Landscape Types(right)>

The wetland vegetation is devided into Ravine forest, Riparian softwood forest(Riparian forest) and swamp forest. Commonly hardwood forest[54] is developing in, softwood forest is developing after the midstream region. The representative species of hardwood forest in Korea are *Zelkova serrata, Fraxinus rhincophylla* and *Celtis sinensis*, and in softwood forest *Salix spp.* and *Alnus japonica*.[55]

The ravine forest is commonly developing along the valley in the upper region of river. The formation by habitat type belongs to Wetland vegetation, and the landscape type is 臨水溪流引接型 (Near to Streamor Pond). And the riparian forest is commonly developing in the upper region of river, the formation by habitat type belongs to Wetland vegetation, and the landscape type is 臨水引接型 (Riverside).

In case of ravine forests, among the natural vegetation, *Fraxinus rhynchophylla* was the main

[54] An ecosystem having deciduous trees as the dominant form of vegetation. An ecosystem consisting principally of trees that yield hardwood. http://www.answers.com/topic/hardwood forest (searching date:May 25, 2012)

[55] Yulkyung Lee, Syntaxonny and Synecology of the Riparian Vegetation in South Korea, Unpublished Ph.D. Dissertaion(University of Kyemyung,2004), p.29

dominant species, and among the plants for traditional landscape architecture, *Zelkova serrata* was accompanied by *Acer spp.(Acer mono, Acer pseudosieboldianum)*, *Celtis sinensis* and *Alnus japonica* was accompanied by *Acer spp.(Acer ginnala, Acer pseudosieboldianum*)and so on. (see table 4.1, 4.2)

In case of riparian forest, it could be known that the main species is *Salix spp*. such as *Salix chaenomeloides, Salix koreensis*, and shrubs are a little, and mainly the herbs including reeds and moor plants accompany. The pertinent species of trees for traditional landscape architecture was *Salix spp*.. *Salix spp.* has wide ecological adaptabililty and is possible to be propagated vegetatively, grows fastly in barren soil. These characteristics of pioneer plant make *Salix spp.* dominant species even in tough riverside environment continously disturbed by flood.[56]

In ravine forest near to mountain stream, if planning an waterfront type private retreat, the vegetation or phytosociological background that forms a reference to plant design is the *Zelkova serrata-Deutzia uniflora* community. And in upper region of river, *Alnus japonica-Rosa multiflora* community.

In riparian forest, if plannning an waterfront type private retreat, the vegetation or phytosociological background that forms a reference to plant design is *Salix koreensis-Phalaris arundinacea* community.

[56] Haeju Kim and Junheon Lee, "An Applied Case to the Slope Revegetation Technology of Biological Engineering Regarding Nutritional Propagation -In the case of sandy cut-slope", *Journal of the Korea Society for Environmental Restoration and Revegetation Technology*, 1(1),1998, pp.63-69

<Table 4.1 Plant Species Composition of Wetland Vegetation>[57]

Traditional Planting Materials			Riverside												
			Ravine forest				Riparian forest								
Korean name	Old name	Scientific name	upper reg	mountain	mountain	upper reg	nationwid	high altitu	slip-off sl	alluvial is	slip-off sl	riparian cl	iff, southern		
			Fraxinus r	Pino-popı	Zelkova sı	Alnus japı	Salix kore	Salix kore	Salix kore	Salix chae	Salix subf	Koelreuteria paniculata-Zizyphus jujuba			
2 단풍나무	丹楓	Acer spp.	o	o	o	o		o			o				
4 다래	藤梨	Actinidia arguta						o							
5 가중나무	樗	Ailanthus altissima										o			
7 오리나무	赤楊	Alnus japonica				o									
123 팽나무	樸樹	Celtis sinensis			o							o			
26 개암나무	榛	Corylus heterophylla	o												
39 원추리	萱	Hemerocallis fulva	o												
43 수국	紫陽花(繡球)	Hydrangea macrophylla	o												
48 가래나무	楸	Juglans mandshurica		o											
55 하늘나리	山丹	Lilium concolor	o												
57 목련	木蓮	Magnolia denudata	o	o											
61 뽕나무	桑	Morus alba						o							
62 산뽕나무	柘	Morus bombycis				o		o							
73 소나무	松	Pinus densiflora		o						o					
80 당옥매(산이스리	郁李	Prunus japonica										o			
84 벚나무	櫻	Prunus serrulata, Prunus sargentii	o	o								o			
91 참나무(졸참)	櫟	Quercus serrata	o						o						
92 참나무(굴참)	櫟	Quercus variabilis										o			
96 철쭉	躑躅	Rhododendron schlippenbachii	o												
97 참꽃나무(영산홍	映山紅	Rhododendron weyrichii													
98 복분자딸기	覆盆子	Robus coreanus Miquel.													
99 월계화	四季花	Rosa chinensis													
100 장미	薔薇	Rosa hybrida													
101 해당화	海棠花,玫瑰	Rosa rugosa													
102 버드나무(왕버들	楊柳	Salix chaenomeloides					o				o				
103 버드나무	楊柳	Salix koreensis					o	o	o	o					
108 조팝나무	繡線菊	Spiraea prunifolia	o												
116 느릅나무	榆	Ulmus davidiana	o		o							o			
120 느티나무	槐	Zelkova serrata	o		o										
122 대추나무	棗	Zizyphus jujuba										o			

[57] Compared Natural Vegetation Structure Analysis Data: Yulkyung Lee, *Ibid.*

<Table 4.2 Community Names>

Ravine forest	*Fraxinus rhynchophylla, Pino-populetum maximowiczii-Pinus densiflora,* ***Zelkova serrata-Deutzia uniflora****,* ***Alnus japonica-Rosa multiflora***
Riparian forest	*Salix koreensis-Phragmites communis, Salix koreensis-Acer ginnala,* ***Salix koreensis-Phalaris arundinacea****,* *Salix chaenomeloides-Phalaris arundinacea, Salix subfragilis-Salix chaenomeloides, Koelreuteria paniculata-Zizyphus jujuba*

*The order of community names is following that of the cells above(from left to right)

<Table 4.3 Plants Species Composition of Selected Communities in Natural Vegetation > [58]

	Zelkova serrata-Deutzia uniflora **Comminity**	***Alnus japonica-Rosa multiflora*** **Community**	***Salix koreensis-Phalaris arundinacea*** **Community**
T1	*Zelkova serrata, Fraxinus rhyncophylla, Actinidia polygama*	*Alnus japonica*	*Salix koreensis*
T2	*Celtis sinensis, Acer mono, Ace pseudo-sieboldianum, Ulmus macrocarpa, Vitis amurensis*	*Morus bombycis, Alnus japonica*	
Shrub	*Alangium platanifolium, Lanicera praeflorens, Lindera erythrocarpa,*	*Acer ginnala, Spiraea prunifolia*	*Salix integra*
Herb	*Clematis heracleifolia, Deutzia uniflora, Staphylea bumalda, Arisaema amurense, Deutzia glabrata*	*Rosa multiflora, Impatiens textori, Lycopus lucidus, Artemisia princeps, Acer ginnala, Carex dispalata, Rubia akane*	*Phalaris arundinacea, Galium spurium, Torilis japonica, Brassica juncea var. Integrifolia, Lolium multiflorum, Carex dispolata*

[58] *Ibid.*

4.3 Coastal Vegetation in Waterfront Type Landscape

Landscape Types		Habitat Types of Set of Species	Physiognomy (植物群落相)
Waterfront Type (臨水型)	臨水引接型 (River, Coast)	Wetland Vegetation	Riparian Forest
			Riparian Cliff Forest
		Coastal Vegetation	Annual plants Communities on Coastal Cliff
			Coastal Cliff Forest
	臨水溪流引接型 (Near to Streamor Pond)	Wetland Vegetation	Swamp Forest
			Ravine Forest

< Figure 4.3 Analyzed Sites of Collected Natural Vegetation Structure Analysis data(left) and Habitat Types following the Landscape Types(right) >

The coastal vegetaion includes coastal cliff forest and forest in island and the lansdscape type is 臨水引接型(coast). The south and west coast have relatively pure natural island and coastal forest which is not disturbed by haman, and show diverse species distribution. However, the east coastal vegetation concentrates on coastal cliff forest, and show simple species distribution. It is because topographical features of Korea, west or south coast has very curvy shoreline and many island, but east coast has simple but stiff shoreline connected with Tabaek ridge.

In the eastern and western coasts, there were many sets of species of human-induced *Robinia pseudoacasia* plantations, but these were excluded from this thesis, because of being artificially planted. The altitude above sea level of most regions where coastal plant communities are located was less than 40m, and no classification was made by height

The share of *Pinus densiflora* and *Pinus thunbergii* was high in all southern, eastern and western coasts, and *Pinus thunbergii* extremely dominated in the eastern coast, and thus the distribution and kinds of deciduous broad-leaved trees were relatively little. In case of the southern coast, the frequency of *Quercus mongolica* among oaks decreases and the frequency of *Quercus*

variabilis and *Quercus serrata* increases, and this coincides with the results of another study[59] that it is because *Quercus mongolica* prefer the regions with relatively low warmth index.

In south coast, *Pinus thunbergii* or *Pinus densiflora* has a great tendency to accompany with *Prunus sargentii, Quercus serrata, Quercus variabilis*. In west coast, *Pinus thunbergii* or *Pinus densiflora* has a tendency to accompany with *Prunus sargentii, Quercus serrata, Rhododendron mucronulatum*. In east coast, *Pinus thunbergii* or *Pinus densiflora* has a tendency to accompany with *Quercus mongolica*.

In southern coastal forest, if planning an waterfront type private retreat, the vegetation or phytosociological background that forms a reference to plant design is the *Quercus serrata-Lindera erythrocarpa* community or *Pinus thunbergii* community. The plant community including *Quercus serrata* as a dominant species should be a reference because *Quercus serrata,* not *Quercus mongolica,* have a tendancy of dominant in southern region.[60]

In western coastal forest, if planning a waterfront type private retreat, the vegetation or phytosociological background that forms a reference to plant design is the *Pinus densiflora-Quercus accutissima* community. *Pinus densiflora* is the characteristic species and *Quercus accutissima* is the dominant species in wetern coast. Therefore, the plant community including both species should be a reference. However, if the site is on windy and salty condition, the *Pinus thunbergii* community can be a reference.

In estern coastal cliff forest, if planning a waterfront type private retreat, the vegetation or phytosociological background that forms a reference to plant design is the *Pinus densiflora- Lespedeza cyrtobotrya* community. *Pinus densiflora* is the characteristic species and *Quercus serrata* and

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[59] Mijung Lee, Community Structure Analysis and Ecological Planting Model Subject of the Principal Quercus Community in Korea, Unpublished Ph.D. Dissertation(University of Chungnam, 2007), p.106

[60] Mijung Lee, *Ibid.*

Lespedeza cyrtobotrya is the dominant species in eastern coast. Therefore, the plant community including those species should be a reference. However, if the site is on windy and salty condition, the *Pinus thunbergii* community can be a reference.

<Table 4.4 Plant Species Composition of Coastal Vegetation>[61]

Traditional Planting Materials			Coast																													
			South Coast											West Coast						East Coast												
Korean name	Old name	Scientific name	Acer pseu	Quercus r	Quercus s	Quercus s	Acer mon	Carpinus	Quercus s	Pinus thu	Camellia j	Chamaecy	Pinus den	Pinus der	Pinus den	Pinus der	Pinus thu	Pinus der	Pinus thu	Pinus thu	Pinus thu	Pinus thu	Pinus den	Pinus den	Pinus den	Pinus den	siflora-Ro
2 단풍나무	丹楓	Acer spp.	o	o	o		o				o						o															
4 다래	藤梨	Actinidia arguta					o					o																				
6 자귀나무	夜合樹	Albizia julibrissin			o	o				o																						
14 동백나무	山茶花	Camellia japonica					o				o	o																				
15 서어나무	西木	Carpinus laxiflora	o		o		o	o		o		o																				
17 밤나무	栗	Castanea crenata				o																										
26 개암나무	榛	Corylus heterophylla		o			o			o																						
27 난(보춘화)	蘭	Cymbidium spp.			o			o		o	o	o																				
31 고욤나무	小柿	Diospyros lotus			o					o										o												
32 보리수나무	菩提樹	Elaeagnus umbellata							o									o														
39 원추리	萱	Hemerocallis fulva					o																									
41 비비추	紫玉簪	Hosta longipes		o		o																										
52 음나무(엄나무)	嚴木	Kalopanax pictus											o																			
55 하늘나리	山丹	Lilium concolor		o	o		o	o		o		o	o																			
61 뽕나무	桑	Morus alba																	o	o												
62 산뽕나무	柘	Morus bombycis			o										o																	
70 후박나무	厚朴	Persea thunbergii									o	o																				
73 소나무	松	Pinus densiflora		o		o		o		o		o	o	o	o	o		o							o	o	o	o				
75 해송(곰솔)	海松	Pinus thunbergii			o	o	o	o	o	o	o	o						o	o	o	o	o	o									
82 복숭아나무	桃	Prunus persica																						o								
84 벚나무	櫻	Prunus serrulata, Prunus sargentii		o	o	o	o	o		o	o		o	o	o	o	o	o						o								
88 상수리나무	橡	Quercus acutissima		o	o	o	o		o	o		o						o														
89 참나무(갈참)	櫟	Quercus aliena				o	o			o											o											
90 참나무(신갈)	櫟	Quercus mongolica	o	o		o												o		o	o		o		o		o				
91 참나무(졸참)	櫟	Quercus serrata	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o									o					
92 참나무(굴참)	櫟	Quercus variabilis			o	o	o	o	o	o		o																				
95 진달래	杜鵑花	Rhododendron mucronulatum		o		o	o	o		o			o	o		o	o	o									o					
96 철쭉	躑躅	Rhododendron schlippenbachii		o	o	o	o			o																						
98 복분자딸기	覆盆子	Robus coreanus Miquel.					o																									
101 해당화	海棠花,玫瑰	Rosa rugosa																				o								o		
105 조릿대	山竹	Sasa borealis	o	o	o					o																						
120 느티나무	槐	Zelkova serrata					o	o			o																					

[61] Compared Natural Vegetation Structure Analysis Data: Multi-layer Planting Model based on Analysis of Natural Plant Structure –Central Inland and South Coast(Kim 2011), the Planting Models of Maritime Forest by the Plant Community Structure Analysis in the Seaside, Incheon (Kwon 2004), Community and Population Structure of Pinus densiflora Forest in Anmyendo Island and Characteristics of there Indivisual Tree Forms(Ahn, 2009), Ecological Characteristics of Japanese Black Pine(Pinus thunbergii) Forests of East Coastal Sand Dunes in Korea(Kim 2003)

<Table 4.5 Community Names>

South Coast	*Acer pseudosiebodianum-Sasa borelis, Quercus mongolica,* ***Quercus serrata-Lindera erythrocarpa****, Quercus serrata-Rhododendron schlippenbachii, Acer mono, Carpinus coreana, Quercus serrata-Miscanthus sinensis var. purpurascens,* ***Pinus thungergii****, Camellia japonica, Chamaecyparis obtusa*
West Coast	*Pinus densiflora, Pinus densiflora-Quercus serrata, Pinus densiflora-Eucaphis japonicus, Pinus densiflora-Styrax japonica,* ***Pinus thunbergii****,* ***Pinus densiflora-Quercus accutissima***
East Coast	***Pinus thunbergii****, Pinus thunbergii-Robinia pseudoacacia, Pinus thunbergii-vitex rotundifolia, Pinus thunbergii-Rosa rugosa, Pinus densiflora, Pinus densiflora-Robinia pseudoacacia,* ***Pinus densiflora-Lespedeza cyrtobotrya****, Pinus densiflora-Rosa rugosa*

*The order of community names is following that of the cells above(from left to right)

<Table 4.6 Plants Species Composition of Selected Communities in Natural Vegetation>[62]

	South Coast		West Coast		East Coast	
	Quercus serrata-Lindera erythrocarpa **Community**	***Pinus thungergii*** **Community**	***Pinus thunbergii*** **Community**	***Pinus densiflora-Quercus accutissima*** **Community**	***Pinus thunbergii*** **Community**	***Pinus densiflora-Lespedeza cryptobotrya*** **Community**
T1	*Quercus serrata, Pinus thunbergii, Carpinus coreana, Quercus mongolica*	*Pinus thunbergii, Quercus serrata, Carpinus laxiflora, Quercus variabilis, Zelkova serrata*	*Pinus thunbergii*	*Pinus densiflora, Quercus accutissima*	*Pinus thunbergii*	*Pinus densiflora*
T2	*Rhus tricocarpa, Styrax japonicus, Lindera erythrocarpa, Sorbus alnifolia, Prunus Sargentii*	*Acer pseudosieboldianum, Cornus kousa, Albizzia julibrissin, Fraxinus sieboldiana*	*Pinus thunbergii, Carpinus coreana, Quercus serrata, Prunus sargentii, Sorbus alnifolia*	*Carpinus coreana, Quercus accutissima, Quercus serrata, Prunus sargentii*	*Pinus thunbergii*	*Pinus densiflora*
Shrub	*Lindera glauca, Rubus crataegifolius, Zanthoxium schinifolium, Rhododendron schlippenbachii*	*Lindera glauca, Rosa multiflora, Rhododendrun mucronulatum, Sasa borealis*	*Elaeagnus umbrellata, Rhododendrun mucronulatum*	*Rhododendrun mucronulatum, Lindera obtusiloba*	*Morus alba, Quercus mongolica, Lespedeza maximowiczii*	*Lespedeza maximowiczii, Rhododendrun mucronulatum, Quercus serrata, Quercus dentata*

[62] *Ibid.*

Herb	*Nepeta cataria, Chrysanthmum zawadskii var.latilobum, Viola chaerophylloides, Parthenocissus tricuspidata, Smilax china, Carex ciliato-marginata*	*Vola rossil, Chrysanthemum zawadskii var. Latilobum, Carex lanceolata, Ainsliaea acerifolia, Arisaema amurense var. Serratum, Smilax china*	*Smilax china*	*Smilax china*	*Bidens bipinnata Artemisia keiskeana Miscanthus sinensis*	*Carex lanceolata Poligonatum odoratum var.pluriflorum Artemisia keiskeana Miscanthus sinensis*

4.4 Montane & Hillside Vegetation in Inland Type Landscape

The Montane & Hillside forest vegetation of Korea is classified as 'Alpine and Subalpine Vegetation', 'Cool-temperate Montane & Hillside Vegetation' and 'Warm-temperate Broad-leaved Forest'. Among these, the vegetations maching with the mountainous and low slope area landscape types of private retreat are all the rest except for alpine and subalpine vegetation(1000-1400m, over 1400m). And consideration should be made by dividing into each height because the frequency of appearance of species of trees is different in each altitude above sea level,

Inland Type (內陸型)	山地型 (Mountainous)	Cool-temperate Montane&Hillside Vegetation	Cool-temperate Mixed Forest (northern/subalpine)	
			Cool-temperate Deciduous Broadleaved Forest	Mid/montane
				Southern/hillside
				Ravine
		Warm-temperate Broad-leaved Forest	Warm-temperate Evergreen Broad-leaved Forest	
			Warm-temperate Deciduous Broad-leaved Forest	
	平地型 (Low slope area near to mountain)	Cool-temperate Montane&Hillside Vegetation	Cool-temperate Deciduous Broadleaved Forest	Mid/montane
				Southern/hillside
		Warm-temperate Broad-leaved Forest	Warm-temperate Evergreen Broad- leaved Forest	
			Warm-temperate Deciduous Broad-leaved Forest	

<Figure 4.4 Analyzed Sites of Collected Natural Vegetation Structure Analysis data(left) and Habitat Types following the Landscape Types(right)>

The traditional used species of trees were matched with each set of species of natural vegetation communities by comparing with the analysis data of sets of species of natural vegetation of mountainous districts of the middle and southern inland (Hyangnobong and Geonbong Mountain in Gangwon-do, the 6 mountains in the capital region including Bukhan Mountain, Nam Mountain and Gwanak Mountain and Deogyu Mountain in Geochang in Gyeongnam). (see Table 4.7)

<Table 4.7 Plant Species Composition of Mountain & Hillside Vegetation>[63]

| Traditional Planting Materials | | | Mountain & Hillside | | |

Over 800m

The frequency of appearance of *Pinus densiflora* is very small, and the frequency of *Acer pseudosieboldianum*, *Quercus mongolica* and *Magnolia sieboldii* was high. In particular, *Quercus mongolica* and *Acer pseudosieboldianum* appear almost always together, and this is because *Acer pseudosieboldianum* is a companion species of *Quercus mongolica*.[64] Besides, *Rhododendron schlippenbachii*, *Salix caprea* in central region and *Quercus serrata*, *Sasa borealis* in southern region also belong to the same community.(see Table 4.8)

'*Quercus mongolica* and *Acer pseudosieboldianum* and *Acer pseudosieboldianum*' are plant species composition of 95% of species affinity. *Quercus mongolica* dominates tree layer. In a case of sub-tree and shrub layer, in central region, *Cornus controversa* and *Fraxinus sieboldiana* have a tendancy to accompany with *Quercus Mongolica*. But, in southern region *Acer pseudosieboldianum* and *Sorbus alnifolia* have a tendancy to accompany with *Quercus mongolica*[65] Therefore, if planing an inland type private retreat in high mountain, the representative plant community including the above plant species compositions can be refered.

In central region, if planing an inland type private retreat in mountainous over 800m landscape, the vegetation or phytosociological background that forms a reference to plant design is the *Quercus mongolica* community or *Quercus monglica-Lespedeza cryptobotrya* community.

In southern region, the vegetation or phytosociological background that forms a reference to plant design is the *Quercus mongolica* community. (see Table 4.9, 4.10)

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64 Jungin Gwak, A Study on Vegetation Structure Characteristics and Ecological Succession Trend of Seoul Urban Forest, Korea, Unpublished Ph.D Dissertation(Unversity of Seoul, 2011), p.

65 Mijung Lee, Community Structure Analysis and Ecological Planting Model Subject of the Prncipal Quercus Community in Korea, Unpublished Ph.D. Dissertation (University of Chungnam, 2007)

<Table 4.8 Plant Species Composition over 800m>

Traditional Planting Materials			Mountain & Hillside																
			over 800m																
			Hyangro-bong ridge					Mt. Gunbong				Mt. Dukyu							
Korean name	Old name	Scientific name	Quer	Quer	Quer	Quro	Vibu	Quer	Quer	Lespe	Betul	Quer	Quer	Taxus	Acer	Acer	Quer	Quer	Fraxi
1 전나무	檜	Abies holophylla																	o
2 단풍나무	丹楓	Acer spp.	o(당)	o	o	o	o	o	o			o	o	o	o	o		o	o
4 다래	藤梨	Actinidia arguta					o												
12 박달나무	檀	Betula schmidtii							o		o		o					o	o
15 서어나무	西木	Carpinus laxiflora						o									o		
26 개암나무	榛	Corylus heterophylla										o							
41 비비추	紫玉簪	Hosta longipes							o										
52 음나무(엄나무)	嚴木	Kalopanax pictus																o	
54 광나무	女貞	Ligustrum japonicum						o											
56 동자꽃	蠅春(秋)羅	Lychnis cognata					o					o							
57 목련	木蓮	Magnolia denudata	o	o				o	o			o			o			o	o
73 소나무	松	Pinus densiflora							o									o	
74 잣나무	栢	Pinus koraiensis	o	o								o	o						
84 벚나무	櫻	Prunus serrulata, Prunus sargentii											o					o	
90 참나무(신갈)	櫟	Quercus mongolica	o	o	o	o	o	o	o		o	o	o	o	o	o	o		
91 참나무(졸참)	櫟	Quercus serrata						o					o				o	o	
92 참나무(굴참)	櫟	Quercus variabilis							o										
95 진달래	杜鵑花	Rhododendron mucronulatum									o								
96 철쭉	躑躅	Rhododendron schlippenbachii	o	o	o	o			o		o								
103 버드나무	楊柳	Salix koreensis	o(호랑)		o(호랑)					o(호랑)					o				
105 조릿대	山竹	Sasa borealis												o		o	o	o	o
108 조팝나무	繡線菊	Spiraea prunifolia	o		o														
109 정향나무	丁香	Syringa velutina	o				o												o
111 주목	赤木	Taxus cuspidata										o		o	o	o			
116 느릅나무	楡	Ulmus davidiana								o									o

<Table 4.9 Community Names>

Quercus mongolica, Quercus mogolica-Acer pseudosiebodianum, Quercus mongolica-Betula ermani cham., Qurcus mongolica-Fraxinus rhynchophylla, Viburnum opulus var. Calvescens, Quercus mongolica, **Quercus mongolica-Lespedeza cryptobotrya**, Lespedeza cryptobotrys, Betula schmidtii, Quercus mongolica, **Quercus mongolica**, Taxus cuspidata, Acer pseudosiebodianum, Acer tschonoskii var. Rubripes, Quercus mongolica, Quercus serrata, Fraxinus mandshrica

*The order of community names is following that of the cells above(from left to right)

<Table 4.10 Plants Species Composition of Selected Communities in Natural Vegetation>[66]

	Over 800m		
	Central		Southern
	***Quercus mongolica* Community**	***Quercus mongolica-Lespedeza cryptobotrya* Community**	***Quercus mongolica* Community**
T1	*Quercus mongolica, Betula costata,Cornus controversa*	*Quercus mongolica, Lespedeza cryptobotrya, Betula schumidtii*	*Quercus mongolica,Carpinus cordata, Betula schmidtii, Quercus serrata*
T2	*Fraxinus mandshurica, Magnolia sieboldii, Betula ermanii, Pinus koraiensis, Salix caprea*	*Pinus densiflora, Quercus variabilis,*	*Acer pseudosieboldianum, Styrax obassia, Sorbus alnifolia, Carpinus cordata*
Shrub	*Rhododendron schlippenbachii, Acer pseudosieboldianum, Syringa reticulata, Weigela florida*	*Rhododendron schlippenbachii, Magnolia sieboldii, Acer pseudosieboldianum, Weigela florida, Tilia megaphylla*	*Lindera obtusiloba, Abelia mosanensis, Corylus sieboldiana*
Herb	*Astilbe rubra, Carex siderosticta, Ainsliaea acerifolia*	*Artemisia keiskeana, Hosta longipes, Dendranthema zawadskii var. latilobum*	*Carex lanceolata, Disporum smilacinum, Paris verticillata*

300-800m

The *Pinus densiflora* that were not seen in the hilly sections appear frequently, and in many cases, *Pinus densiflora*, *Acer pseudosieboldianum* and *Quercus mongolica* appeared together accompanying each other. The frequency of appearance of *Quercus mongolica* is discovered in almost all sets of species. In addition, *Rhododendron schlippenbachii*, *Prunus sargentii*, *Quercus serrata* and so on had a tendency to accompany together.(see Table 4.11).

Succession in Korean mountainous districts generally proceeds from *Pinus densiflora* through *Quercus spp.* including *Quercus mongolica* finally into*Carpinus laxiflora* or *Carpinus cordata* climax forest.[67] If planing an private retreat in mountainous landscape(300-800m), considering the goal to improve the surrounding landscape and creat a ecologically sustainable garden, it need to refer the designing principle of mass plating which selects a plant in mid-step with high species diversity in

[66] *Ibid.*

[67] Jongyup Kim, Development of the Community Planting Models for the Urban Green Space in the Metropolitan Area, the Middle Temperate Zones, Korea, Unpublished Ph.D Dissertation(University of Seoul, 2006), pp.6-9

succession. Therefore, the community of *Quercus spp.* which is main dominant in mid-step of succession in Korea must be refered in design.

In central region, if planing an inland type private retreat in 300-800m mountainous landscape, the vegetation or phytosociological background that forms a reference to plant design is the *Pinus densiflora-Quercus variablis* community or *Pinus densiflora-Rhododendron mucronulatum* community.

In southern region, the vegetation or phytosociological background that forms a reference to plant design is the *Carpinus tschonoskii* community. (see Table 4.12, 4.13)

<Table 4.11 Plant Species Composition in 300-800m>

Traditional Planting Materials			Mountain &Hillside										
			300-800m										
			Hyangro-bong, Mt. Gunbong									Mt. Bukhan	Mt. Dulyu
Korean name	Old name	Scientific name	Quercus r	Quercus r	Quercus r	Pinus den	Carpinus	Pinus den	Pinus den	Quercus s	Salix capr	Pinus den	Carpinus
2 단풍나무	丹楓	Acer spp.	o	o	o			o				o	o
4 다래	藤梨	Actinidia arguta		o			o						
12 박달나무	檀	Betula schmidtii		o						o			
15 서어나무	西木	Carpinus laxiflora		o			o						o
41 비비추	紫玉簪	Hosta longipes							o	o			
48 가래나무	楸	Juglans mandshurica					o				o		
52 음나무(엄나무)	嚴木	Kalopanax pictus	o										
57 목련	木蓮	Magnolia denudata						o					
62 산뽕나무	柘	Morus bombycis									o		
73 소나무	松	Pinus densiflora	o		o	o		o	o			o	
74 잣나무	栢	Pinus koraiensis				o							
84 벚나무	櫻	Prunus serrulata, Prunus sargentii					o				o	o	
90 참나무(신갈)	櫟	Quercus mongolica	o	o	o	o	o	o	o	o	o	o	
91 참나무(졸참)	櫟	Quercus serrata						o		o	o		o
92 참나무(굴참)	櫟	Quercus variabilis				o		o	o				
95 진달래	杜鵑花	Rhododendron mucronulatum						o	o			o	
96 철쭉	躑躅	Rhododendron schlippenbachii		o				o	o			o	
103 버드나무	楊柳	Salix koreensis			o(호랑)						o(호랑)		o
105 조릿대	山竹	Sasa borealis											o
108 조팝나무	繡線菊	Spiraea prunifolia									o		

<Table 4.12 Community Names>

Quercus mongolica-Kalopanax pictus, Quercus mongolica-Stylax obassia, Quercus mongolica-Alnus hirsuta var. Sibirica, Pinus densiflora, Carpinus laxiflora, **Pinus densiflora-Quercus variabilis**, Pinus densiflora-Quercus mongolica, Quercus serrata-Fraxinus mandshurica, Salix caprea-Alnus hirsuta var. Sibirica, **Pinus densiflora-Rhododendron mucronulatum**, **Carpinus tschonoskii**

*The order of community names is following that of the cells above(from left to right)

<Table 4.13 Plants Species Composition of Selected Communities in Natural Vegetation>[68]

	300- 800m		
	Central		Southern
	***Pinus densiflora-Quercus variabilis* Community**	***Pinus densiflora-Rhododendron mucronulatum* Community**	***Carpinus tschonoskii* Community**
T1	*Pinus densiflora, Quercus mongolica, Quercus variabilis*	*Pinus densiflora, Quercus mongolica,*	*Carpinus tschonoskii, Quercus serrata, Carpinus cordata, Salix caprea*
T2	*Pinus densiflora, Quercus variabilis, Quercus serrata*	*Pinus densiflora, Quercus serrata, Prunus sargentii*	*Acer pseudosieboldianum, Carpinus cordata*
Shrub	*Rhododendron schlippenbachii, Rhododendron mucronulatum, Lespedeza cryptobotrya, Acer pseudosieboldianum Prunus sargentii*	*Rhododendron mucronulatum, Sorbus alnifolia, Rhus tricocarpa, Zanthoxylum schinifolium*	*Callicarpa japonica, Euonymus planipes, Stephylea bumalda*
Herb	*Artemisia keiskeana, Dendranthema zawadskii var. Latilobum, Hosta longipes*	*Spodiopogon sibiricus, Artemisia keiskeana, Hemerocalis minor*	*Sasa borealis, Vitis murensis, Ainsliaea acerifolia*

[68] *Ibid.*

100-500m

In Gangwon-do, as the altitude decreases, there was a tendency that the *Quercus serrata* and *Acer pseudosieboldianum* rather than *Quercus mongolica* accompanied, and in case of the mountains in the middle capital regions, *Pinus densiflora*, *Prunus sargentii*, *Quercus mongolica* and *Rhododendron mucronulatum* showed a tendency to appear together.(see table 4.14)

If planning an inland type private retreat in low mountainous landscape below 500m in central region, the vegetation or phytosociological background that forms a reference to plant design is the *Pinus densiflora-Quercus serrata* community or *Quercus mongolica-Rhododendron mucronulatum* community.

The low slope area near to mountain type(平地型) under inland type seemd as slow downhill or low slope area near to mountain as shown in the above Table 3.2. Therefore, if planing an inland type private retreat in hillside with low slope in central region, the vegetation or phytosociological background that forms a reference to plant design is the *Prunus sargentii-Quercus mongolica* community or *Quercus mongolica-Sorbus alnifolia* community.

In southern region, the vegetation or phytosociological background that forms a reference to plant design is the *Pinus densiflora* community. (see Table 4.15, 4.16)

<Table 4.14 Plant Species Composition in 100-500m>

Traditional Planting Materials			Mountain &Hillside																				
			100-500m																				
			Hyangro-bong, Mt. Gunbong						Mt. Bukhan, Mt. Nam									Central region(6Mt.s)					Mt. Dulyu
Korean name	Old name	Scientific name	Pinus den	Fraxinus r	Quercus s	Juglans m	Juglans m	Quercus s	Quercus r	Quercus r	Quercus r	Quercus r	Quercus r	Quercus r	Prunus sa	Pinus den	Quercus a	Quercus r	Quercus r	Quercus r	Quercus r	Pinus den
2 단풍나무	丹楓	Acer spp.	o				o	o	o		o	o	o		o		o	o		o	o	
4 다래	藤梨	Actinidia arguta												o								
5 가중나무	椿	Ailanthus altissima												o	o	o		o				
12 박달나무	檀	Betula schmidtii			o																	
15 서어나무	西木	Carpinus laxiflora					o															
17 밤나무	栗	Castanea crenata							o						o		o	o	o		o	
26 개암나무	榛	Corylus heterophylla									o			o			o		o	o		
27 난(보춘화)	蘭	Cymbidium spp.																				o
37 은행나무	銀杏	Ginkgo biloba													o							
39 원추리	萱	Hemerocallis fulva							o	o	o						o	o				o
48 가래나무	楸	Juglans mandshurica			o	o	o															
52 음나무(엄나무)	嚴木	Kalopanax pictus	o										o									
57 목련	木蓮	Magnolia denudata					o		o								o				o	
62 산뽕나무	桑	Morus bombycis			o		o	o								o						
73 소나무	松	Pinus densiflora	o									o			o	o	o	o		o	o	o
74 잣나무	栢	Pinus koraiensis	o												o	o	o	o	o			
84 벚나무	櫻	Prunus serrulata, Prunus sargentii		o					o			o	o	o	o	o	o	o	o	o	o	
88 상수리나무	橡	Quercus acutissima									o				o	o	o	o	o	o		
89 참나무(갈참)	櫟	Quercus aliena															o					
90 참나무(신갈)	櫟	Quercus mongolica		o	o				o	o	o	o	o	o	o	o		o	o	o	o	o
91 참나무(졸참)	櫟	Quercus serrata	o	o	o	o	o	o									o					o
92 참나무(굴참)	櫟	Quercus variabilis	o														o					o
95 진달래	杜鵑花	Rhododendron mucronulatum							o	o	o	o	o	o	o		o	o	o	o	o	o
96 철쭉	躑躅	Rhododendron schlippenbachii							o	o	o						o	o	o	o	o	
103 버드나무	楊柳	Salix koreensis		o(호랑)																		
116 느릅나무	楡	Ulmus davidiana	o		o	o		o														
117 산앵도	山櫻	Vaccinium koreanum							o												o	
120 느티나무	槐	Zelkova serrata											o		o							

<Table 4.15 Community Names>

Pinus densiflora-Quercus serrata, Fraxinus mandshurica, Quercus serrata-Fraxinus mandshurica, Juglans mandshurica, Juglans mandshurica-Styrax obassia, Quercus serrata, Quercus mogolica-Acer pseudosiebodianum, Quercus mongolica-Disporum smilacinum, Quercus mongolica-Rhododendron schlippenbachii, Quercus mongolica-Styrax japonicus, Quercus mongolica-Fraxinus rhynchophylla, Quercus mongolica-Quercus serrata, **Prunus sargentii-Quercus mongolica**, Pinus densiflora-Pinus koraiensis, Quercus accutissima, **Quercus mongolica-Sorbus alnifolia**, Quercus mongolica-Juniperus rigida, Quercus mongolica-Rhododendron schlippenbachii , **Quercus mongolica-Rhododendron mucronulatum**, **Pinus densiflora**

*The order of community names is following that of the cells above(from left to right)

<Table 4.16 Plants Species Composition of Selected Communities in Natural Vegetation>[69]

	Mountain & Hillside				
	Central				Southern
	Mountain & Hillside		Low slope Area Near to Mountain(平地型)		
	***Pinus densiflora-Quercus serrata* Community**	***Quercus mongolica-Rhododendron mucronulatum* Community**	***Prunus sargentii-Quercus mongolica* Community**	***Quercus mongolica-Sorbus alnifolia* Community**	***Pinus densiflora* Community**
T1	*Pinus densiflora, Quercus serrata, Fraxinus mandshurica, Quercus variabilis*	*Pinus densiflora, Quercus mongolica,*	*Prunus sargentii, Quercus mongolica, Pinus densiflora*	*Quercus mongolica, Quercus accutissima, Pinus densiflora*	*Pinus densiflora, Quercus variabilis*
T2	*Quercus variabilis, Kalopanax pictus*	*Pinus densiflora, Quercus serrata, Prunus sargentii*	*Alnus hirsuta, Castanea crenata, Quercus accutissima, Acer pseudosieboldianum, Carpinus cordata*	*Sorbus alnifolia, Pinus densiflora, Styrax japonicus, Juniperus rigida*	*Pinus densiflora, Quercus serrata, Styrax japonicus, Juniperus rigida*
Shrub	*Acer pseudosieboldianum, Weigela florida, Stephandra incisa, Lespedeza maximowixcii*	*Rhododendron mucronulatum, Sorbus alnifolia, Rhus tricocarpa, Zanthoxylum schinifolium*	*Stephandra incisa, Rosa multiflora, Symplocos chinensis var.pilosa, Euonymus alatus, Callicarpa japonica*	*Rhododendron mucronulatum, Rhododendron schlippenbachii*	*Rhododendron mucronulatum, Zanthoxylum schinifolium, Vaccinium oldhamii*
Herb	*Dendranthema zawadskii var. Latilobum, Potentilla freyniana, Artemisia stolonifera, Spodiopogon sibiricus*	*Spodiopogon sibiricus, Artemisia keiskeana, Disporum smilacinum*	*Rubus crataegifolius Cocculus trilobus, Parthenocissus tricuspidata, Smilax sieboldii*	*Carex humilis, Hemerocallis fulva, Carex ranceolata*	*Carex humilis, Miscanthus sinensis var. purpurascens, Cymbidium goeringii*

[69] *Ibid.*

4.5 Detailed Selection Criteria for Plants Species

The above sorted out species compositions of plants for traditional landscape architecture are based on the ecological species composition in natural vegetation by landscape types.

If planing a private retreat in certain landscape(Waterfront or Inland type), to create a sustainble and natural-friendly vegetation landscape of outer garden(外園), one can refer to the above sorted out plants species composition by landscape types as the vegetation or phytosociological background for plant design. In this case, the other natural companion species, though is not a plant for traditional landscape architecture, in the representative natural plants community can be also refered together. Replacing the companion species of the natural plant community with a different, but similar species for traditional landscape architecture is an interpretation that becomes a creative act of garden design.

	Plants Community in Natural Vegetation	**Species Selection**
T1	*Zelkova serrata(느티),* *Fraxinus rhyncophylla(물푸레),* *Actinidia polygama(다래)*	***Zelkova serrata(느티나무),*** *Fraxinus rhyncophylla(물푸레),* *Actinidia arguta (다래)*
T2	*Celtis sinensis(팽나무),* *Ace pseudo-sieboldianum(당단풍),* *Acer mono(고로쇠),* *Ulmus macrocarpa(왕느릅),* → *Ulmus davidiana(느릅),* *Vitis amurensis(왕머루)* → *Vitis vinitera(포도)*	***Celtis sinensis(팽나무),*** ***Acer pseudo-sieboldianum(당단풍),*** *Acer mono(고로쇠)*
Shrub	*Alangium platanifolium(박쥐나무),* *Lindera erythrocarpa(비목),* ~~*Lanicera praeflorens*~~	*Alangium platanifolium(박쥐나무),* *Lindera erythrocarpa(비목)* *Deutzia uniflora(매화말발도리),*
Herb	*Clematis heracleifolia(병조희풀),* *Deutzia uniflora(매화말발도리),* *Arisaema amurense(둥근잎천남성),* → *Acorus gramineus(석창포),* ~~*Deutzia glabrata, Staphylea bumalda*~~	*Clematis heracleifolia(병조희풀),*

*Bold fonts are the species composition of the plants for traditional landscape architecture found by this study.
*Replacement the companion species in natural vegetation with the similar species of plants for traditional landscape architecture : *Ulmus macrocarpa→ Ulmus davidiana, Vitis amurensis→Vitis vinitera, Arisaema amurense→Acorus gramineus*
*The underlined speicies are the companion species in natual vegetation which do not belong to the plants for traditional landscape architecture.

<Figure 4.5 Example of Species Selection>

And if it is possible, the natural companion species can be replaced by the plants for traditional landscape architecture which belong to same 'genus' or 'family' with the companion species or similar characteristics and shape with the companion species.[70] (see Figure 4.5)

[70] Minkyung Kim, *op.cit.*, p57

4.6 Species Selections for Representation of Vegetation Landscape of Private Retreats by Landscape types

4.6.1 Private Reteat in Waterfront Type(Riverside, Swamp)

<Table 4.17 Species Selection for Private Reteat in Waterfront(Riverside, Swamp)>

	Riverside, Swamp		
	Species Selection No.1(Ravine)	**Species Selection No.2(Riparian)**	**Species Selection No.3(swamp)**
T1	***Zelkova serrata(느티나무),*** *Fraxinus rhyncophylla(물푸레),* *Actinidia arguta (다래)*	***Alnus japonica(오리나무)***	***Salix koreensis(버드나무)***
T2	***Celtis sinensis(팽나무)***, ***Acer pseudo-sieboldianum(당단풍)***, *Acer mono(고로쇠)* *Ulmus davidiana(느릅),* *Vitis vinitera(포도)*	*Morus bombycis(산뽕나무),* *Alnus japonica(오리나무)*	
Shrub	*Alangium platanifolium(박쥐나무),* *Lindera erythrocarpa(비목)* *Deutzia uniflora(매화말발도리),*	***Acer ginnala(신나무)***, *Spiraea prunifolia(조팝나무),* *Rosa multiflora(찔레꽃),*	*Salix integra(개키버들)*
Herb	*Clematis heracleifolia(병조희풀), ,* *Acorus gramineus(석창포),*	*Impatiens textori(물봉선),* *Carex dispalata(삿갓사초)*	*Imperata cylindrica var.koenigii(띠),* *Torilis japonica(사상자),* *Brassica juncea var.Integrifolia(갓),* *Carex dispolata(삿갓사초)*

*Replacement the companion species in natural vegetation with the similar species of plants for traditional landscape architecture : *Ulmus macrocarpa→ Ulmus davidiana, Vitis amurensis→Vitis vinitera, Arisaema amurense→Acorus gramineus, Phalaris arundinacea→Imperata cylindrica var.koenigii*

*The underlined speicies are the companion species in natual vegetation which do not belong to the plants for traditional landscape architecture.

4.6.2 Private Retreat in Waterfront Type(Coast)

<Table 4.18 Species Selection for Private Reteat in Waterfront(Coast)>

	South Coast		West Coast		East Coast	
	Species Selection No.1	**Species Selection No.2**	**Species Selection No.1**	**Species Selection No.2**	**Species Selection No.1**	**Species Selection No.2**
T1	***Quercus serrata(졸참)***, ***Pinus thunbergii(곰솔)***, *Carpinus laxiflola(서어)*, *Quercus mongolica(신갈)*	***Pinus thunbergii(곰솔)***, ***Quercus serrata(졸참)***, *Carpinus laxiflora(서어)*, ***Quercus variabilis(굴참)***, *Zelkova serrata(느티)*	***Pinus thunbergii(곰솔)***	***Pinus densiflora(소나무)***, ***Quercus accutissima (상수리)***	***Pinus thunbergii(곰솔)***	***Pinus densiflora(소나무)***
T2	*Styrax japonicus(때죽)*, *Lindera erythcarpa(비목)*, *Malus sieboldii(아그배)*, ***Prunus Sargentii(산벚)***	*Acer pseudosieboldianum (당단풍)* *Cornus kousa(산딸)*, *Albizzia julibrissin(자귀)*	*Pinus thunbergii(곰솔)*, *Carpinus laxiflora(서어)*, ***Quercus serrata(졸참)***, ***Prunus sargentii(산벚)***, *Malus sieboldii(아그배)*	*Carpinus laxiflora(서어)*, *Quercus accutissima(상수리)*, ***Quercus serrata(졸참)***, ***Prunus sargentii(산벚)***	*Pinus thunbergii(곰솔)*	*Pinus densiflora(소나무)*
Shrub	*Rubus coreanus(복분자딸기)* ***Rhododendron schlippenbachii(철쭉)***, *Lespedeza bicolor(싸리)*	*Rosa rugasa (해당화)*, ***Rhododendrun mucronulatum(진달래)***, *Sasa borealis(조릿대)*	*Elaeagnus unbrellata (보리수)*, ***Rhododendrun mucronulatum(진달래)***	***Rhododendrun mucronulatum(진달래)***, *Lindera obtusiloba(생강)*	*Morus alba(뽕나무)*, ***Quercus mongolica(신갈)***, *Lespedeza maximowiczii (조록싸리)*	*Lespedeza maximowiczii (조록싸리)*, *Rhododendrun mucronulatum(진달래)*, ***Quercus serrata(졸참)***, *Quercus dentata(떡갈)*
Herb	*Nepata cataria(개박하)*, *Chrysanthmum zawadskii var.latilobum(구절초)*, *Viola chaerophylloides(남산제비꽃)*, *Parthenocissus tricuspidata(담쟁이덩굴)*	*Viola rossii(고깔제비꽃)*, *Chrysanthemum zawadskii var. Latilobum(구절초)*, *Carex lanceolata(그늘사초)*, *Ainsliaea acerifolia(단풍취)*, *Acorus gramineus(석창포)*, *Smilax china(청미래덩굴)*	*Smilax china(청미래덩굴)*	*Smilax china(청미래덩굴)*	*Bidens bipinnata(도깨비바늘)*, *Artemisia keiskeana(맑은대쑥)* *Miscanthus sinensis(참억새)*	*Carex lanceolata(그늘사초)* *Poligonatum odoratum var.pluriflorum(둥굴레)* *Artemisia keiskeana(맑은대쑥)* *Miscanthus sinensis(참억새)*

*Replacement the companion species in natural vegetation with the similar species of plants for traditional landscape architecture : *Carpinus coreana→Carpinus laxiflora, Rhus tricocarpa→Rubus coreanus, Rosa multiflora→Rosa rugasa, Arisaema amurens var.serratum→Acorus gramineus, Sorbus alnifolia→Malus sieboldii*

*The underlined speicies are the companion species in natual vegetation which do not belong to the plants for traditional landscape architecture.

4.6.3 Private Retreat in Inland Type(Mountain and Hillside)

<Table 4.19 Species Selection for Private Reteat in Inland(Mountain over 800m)>

	Mountain(over 800m)		
	Central		**Southern**
	Species Selection No.1	**Species Selection No.2**	**Species Selection**
T1	***Quercus mongolica(신갈)***, *Betula costata(거제수)*, *Cornus controversa(층층)*	***Quercus mongolica(신갈)***, *Lespedeza crytobotrya(참싸리)*, *Betula schumidtii(박달)*	***Quercus mongolica(신갈)***, *Carpinus laxiflora(서어)* , *Betula schmidtii(박달)*, *Quercus serrata(졸참)*
T2	*Fraxinus mandshurica(들메)*, ***Magnolia sieboldii(산목련)***, *Betula ermanii(사스래)*, *Pinus koraiensis(잣나무)*, *Salix caprea(호랑버들)*	*Pinus densiflora(소나무)*, *Quercus variabilis(굴참)*,	***Acer pseudosieboldianum(당단풍)*** *Styrax obassia(쪽동백)*, *Malus sieboldii(아그배)*,
Shrub	***Rhododendron schlippenbachii(철쭉)***, ***Acer pseudosieboldianum(당단풍)*** *Syringa velutina(정향)*, *Weigela florida(붉은병꽃)*	***Rhododendron schlippenbachii(철쭉)***, ***Magnolia sieboldii(산목련)***, ***Acer pseudosieboldianum(당단풍)*** *Weigela florida(붉은병꽃)*, *Tilia megaphylla(염주나무)*	*Lindera obtusiloba(생강)*, *Abelia mosanensis(댕강)*, *Corylus heterophylla(개암)*
Herb	*Astilbe rubra(노루오줌)*, *Carex siderosticta(대사초)*, *Ainsliaea acerifolia(단풍취)*	*Artemisia keiskeana(맑은대쑥)*, *Hosta longipes(비비추)*, *Dendranthema zawadskii var. latilobum(구절초)*	*Carex lanceolata(그늘사초)*, *Disporum smilacinum(애기나리)*, *Paris verticillata(삿갓나물)*

*Replacement the companion species in natural vegetation with the similar species of plants for traditional landscape architecture : *Carpinus cordata→Carpinus laxiflora, Sorbus alnifolia→Malus sieboldii, Corylus sieboldiana→Corylus heterophylla*

*The underlined speicies are the companion species in natual vegetation which do not belong to the plants for traditional landscape architecture.

<Table 4.20 Species Selection for Private Reteat in Inland(Mountain 300-800m)>

	Mountain(300-800m)		
	Central		**Southern**
	Species Selection No.1	**Species Selection No.2**	**Species Selection**
T1	***Pinus densiflora(소나무)***, ***Quercus mongolica(신갈)***, *Quercus variabilis(굴참)*	***Pinus densiflora(소나무),*** ***Quercus mongolica(신갈)***	*Carpinus tschonoskii(개서어)* *Quercus serrata(졸참),* *Salix caprea(호랑버들)*
T2	*Pinus densiflora(소나무),* *Quercus variabilis(굴참),* *Quercus serrata(졸참)*	*Pinus densiflora(소나무),* *Quercus serrata(졸참),* *Prunus sargenti(산벚)*	*Acer pseudosieboldianum(당단풍)* *Carpinus laxiflora(서어)*
Shrub	*Rhododendron schlippenbachii(철쭉)* *Rhododendron mucronulatum(진달래)* *Lespedeza crytobotrya(참싸리),* ***Acer pseudosieboldianum(당단풍)*** *Prunus sargentii(산벚)*	*Rhododendron Mucronulatum(진달래),* *Malus sieboldii(아그배) ,* *Rubus coreanus(복분자딸기)* *Zanthoxylum schinifolium(산초)*	*Callicarpa japonica(작살),* *Euonymus planipes(회나무),* *Staphylea bumalda(고추나무)*
Herb	*Artemisia keiskeana(맑은대쑥),* *Dendranthema zawadskii var. Latilobum(구절초),* *Hosta longipes(비비추)*	*Imperata cylindrica var.koenigii(띠),* *Artemisia keiskeana(맑은대쑥)* *Hemerocalis fulva(원추리)*	*Sasa borealis(조릿대),* *Vitis vinitera(포도),* *Ainsliaea acerifolia(단풍취)*

*Replacement the companion species in natural vegetation with the similar species of plants for traditional landscape architecture : *Sorbus alnifolia→Malus sieboldie, Rhus tricocarpa→Rubus coreanus, Spodiopogon sibiricus→ Imperata cylindrica var.koenigii, Hemerocalis minor→Hemerocalis fulva, Carpinus cordata→ Carpinus laxiflora, Vitis amurensis→Vitis vinitera*

*The underlined speicies are the companion species in natual vegetation which do not belong to the plants for traditional landscape architecture.

<Table 4.21 Species Selection for Private Reteat in Inland(Mountain& Hillside 100-500m)>

	Mountain & Hillside(100-500m)				
	Central				**Southern**
	Mountain & Hillside		Low slope Area Near to Mountain		
	Species Selection No.1	**Species Selection No.2**	**Species Selection No.1**	**Species Selection No.2**	**Species Selection**
T1	***Pinus densiflora* (소나무)** ***Quercus serrat(졸참)***, *Fraxinus mandshurica (들메)* *Quercus variabilis (굴참)*	***Pinus densiflora* (소나무)** ***Quercus mongolica* (신갈)**	***Prunus sargentii* (산벚)**, ***Quercus mongolica* (신갈),** ***Pinus densiflora* (소나무)**	***Quercus mongolica* (신갈)**, *Quercus accutissima (상수리),* *Pinus densiflora (소나무)*	*Pinus densiflora (소나무),* *Quercus variabilis (굴참)*
T2	*Quercus variabilis (굴참)* *Kalopanax pictus (엄나무)*	*Pinus densiflora (소나무)* *Quercus serrata (졸참)* ***Prunus sargentii* (산벚)**	*Alnus japonica (오리),* *Castanea crenata (밤나무),* *Quercus accutissima (상수리),* ***Acer pseudosieboldianum* (당단풍),** *Carpinus laxiflola (서어)*	*Malus sieboldii (아그배),* ***Pinus densiflora* (소나무)**, *Styrax japonicus (때죽),* *Juniperus rigida (노간주)*	*Pinus densiflora (소나무),* *Quercus serrata (졸참),* *Styrax japonicus (때죽),* *Juniperus rigida (노간주)*
Shrub	***Acer pseudosieboldianu* (당단풍)**, *Weigela florida (붉은병꽃)* *Spiraea prunfolia(조팝),* *Lespedeza maximowixcii(조록싸리)*	***Rhododendron mucronulatu* (진달래)**, *Malus sieboldii (아그배)* *Rubus coreanus (복분자딸기),* *Zanthoxylum schinifolium(산초)*	*Spiraea prunfolia (조팝),* *Rosa multiflora (찔레꽃),* *Symplocos chinensis var.pilosa(노린재),* *Euonymus alatus (화살),* *Callicarpa japonica (작살)*	***Rhododendron mucronulatum* (진달래)**, *Rhododendron schlippenbachii(철쭉)*	*Rhododendron mucronulatum (진달래),* *Zanthoxylum schinifolium (산초),* *Vaccinium koreanum(산앵도)*
Herb	*Dendranthema zawadskii var. Latilobum(구절초),* *Potentilla freyniana (세잎양지꽃),* *Artemisia stolonifera (넓은잎외잎쑥)* *Imperata cylindrica var.koenigii(띠)*	*Imperata cylindrica var.koenigii(띠)* *Artemisia keiskeana (맑은대쑥)* *Lilium concolor (하늘나리)*	*Rubus coreanus (복분자딸기)* *Parthenocissus tricuspidata (담쟁이덩굴),* *Smilax sieboldii (청가시덩굴)*	*Carex humilis(산거울),* *Hemerocallis fulva (원추리)* *Carex ranceolata (그늘사초)*	*Carex humilis (산거울),* *Miscanthus sinensis var. purpurascens (참억새),* *Cymbidium goeringii(보춘화)*

*Replacement the companion species in natural vegetation with the similar species of plants for traditional landscape architecture : *Stephandra incisa → Spiraea prunfolia, Spodiopogon sibiricus → Imperata cylindrica var.koenigii, Sorbus alnifolia →Malus sieboldii, Rhus tricocarpa, Rubus crataegifolius →, Disporum smilacinum → Lilium concolor, Alnus hirsuta →Alnus japonica, Carpinus cordata → Carpinus laxiflora, Vaccinium oldhamii → Vaccinium koreanum*

*The underlined speicies are the companion species in natual vegetation which do not belong to the plants for traditional landscape architecture.

4.6.4 Species Selections for Inner Garden

<Table 4.22 Species Selection for Inner Garden>

	Species Selection for Inner Garden
Front door	- Inland type landscape : Sophora japonica(회화), Zelkova serrata(느티), Pinus densiflora(소나무) / Southrrn region:Firmiana simplex(벽오동) - Waterfront type landscape : Salix koreensis(버드나무), Zelkova serrata(느티)
Courtyard (中庭)	접시꽃 Althaea rosea, 베고니아 Begonia, 맨드라미 Celosia cristata, 난(보춘화) Cymbidium spp, 패랭이꽃 Dianthus chinensis, 원추리 Hemerocallis fulva, 봉선화 Impatiens balsamina, 금전화(금불초) Inula britannica var. japonica, 동자꽃 Lychnis cognata, 당아욱 Malva sinensis var. mauritiana, 수선화 Narcissus tazetta var. chinensis, 백일홍 Zinnia elegans, 나팔꽃 Pharbitis nil, 길상초 Reineckia carnea, 한련 Tropaeolum majus, 작약 Paeonia lactiflora
Front of garden (庭前)	Phyllostachys spec. (대나무), Daphne odora (서향), Punica granatum (석류나무)
Garden (inner and rear garden)	Prunus mume (매화나무), Prunus persica(복숭아나무), Prunus salicina(자두나무), Paeonia suffruticosa(모란), Syringa velutina (정향나무), Rhododendron indicum(왜철쭉), Rosa hybrida (장미) Prunus tomentosa(앵도나무) Rosa chinensis(월계화),Chrysanthemum spp.(국화), Lilium concolor(하늘나리), Hosta longipes (비비추) Southern region: Camellia japonica(동백나무),Gardenia jasminoides for. grandiflora (치자나무), Citrus unshiu (귤나무(유자))
Beside the pond	Salix pseudolasiogyne(능수버들), Lagerstroemia indica(배롱), Acorus gramineus (석창포), Hosta plantaginea(옥잠화), Musa basjoo(파초), Nelumbo nucifera(연), Hydrangea macrophylla(수국)
Along the fence	Chrysanthemum spp.(국화), Euonymus japonicus (사철나무), Hibiscus syriacus (무궁화), Poncirus trifoliata (탱자나무)
Around house	Pinus densiflora forest(소나무숲) / Phyllostachys spec. forest (대나무숲)

V. Conclusions

The constructional principle of Private retreats (Byulsoe) which shows the natural beauty of Korean traditional landscape architecture is to select the good location where has scenic natural landscape. Maximum outer garden can be created by using the beautiful natural vegetation as surrounding landscape. And then, minimum inner garden can be created following the traditional planting technique and the fairness and avoidance of planting based on symbolism and ecological characteristic of plants.

The contemporary represented traditional private retreat style gardens are located on where has poor natural vegetation landscape. This disadvantage causes that the landscape of garden can not be sufficiently represented as beautiful as traditional landscape. Therefore, the complementary measures for poor vegetation by planting are needed. Finding out the ecologically harmonious plants species combination in natural vegetation by landscape types and applying these plants species combination to the planting design of traditional garden can lead to the successful representation of ecologically sustainable and natural-familiar private retreat(Byulsoe).

In chapter II, the plants for traditional landscape architecture which can be used as plant materials for representation of private retreat were found through searching old literature and previous studies. And total 120 species of the plants for traditional landscape architecture including newly found 16 species of tree, 6 species of shrub and 27 species of flower by this study were searched and arranged. And among these plants species for traditional landscape architecture, the symbolic meanings of about 80 species including newly found symbolic meanings of 40 species by this study were also found and claassified through searching old literature and previous studies. To know the constructional principle of traditional garden for representation of vegetation landscape of private retreat, the traditional constructional principle based on symbolism and the fairness and avoidance of

planting were studied.

To select and suggest the plant species for representation of vegetation landscape of private retreat, the landscape types of exsisting private retreats should be understood. In chapter III, the typical landscapes of exsisting traditional private retreats were classified under 4 types (Waterfront-riverside and coast, Waterfront-near to stream, Inland-mountainous, Inland-low slope area) following the topographic chracteristic of the location. And then, the vegetation types following habitat types of natural vegetations were determined by the above 4 landscape types because the plant community (set of species) in natural vegetation reflects on the environmental conditions of its location.

In chapter IV, the natural vegetation structure analysis data by the 4 landscape types (total 12 data) were collected and compared with the list of plants species for traditional landscape architecture searched by this study in chapter II and finally extracted common plants species from the list. As a result, over 10 ecologically harmonious species combinations of plants for traditional landscape archtecture by landscape types were found.

In addition, the species selections for outer garden for private retreat style traditional garden including the ecologically harmonious species combinations of plants for traditional landscape architecture by landscape types found in former part of chapter IV were suggested and the species selections for inner garden for private retreat style traditional garden following the traditional constructional principle based on symbolism and the fariness and avoidance of planting searched in chapter II were also suggested. And the species selections included replacing the companion species of the natural plant community with a different, but similar species for traditional landscape architecture as an interpretation that becomes a creative act of garden design.

This study could have diverse variables depending on the confidence of the collected natural vegetation structure analysis data. And not only the plants species but other engineering considerations

such as the crown or planting density of the tree should be applyed to the planting design for private retreat (Byulseo). This study is only about ecologically harmonious species compositions of plants for traditional landscape architecture. Therefore, further studies on planting design for traditional Korean garden reflecting these diverse considerations are needed.

The species selections in latter part of chapter IV are just examples. If refering a different natural plants community by landscape types, it is possible to make various species selections by combining other species which have species affinity over 90% with each other .

If one wish to make a private retreat on somewhere, the trick is to find out first what kind of vegetation or what kind of plant community you can expect or develop on the site where you want to make a private retreat style garden. If there is already a natural plant community that looks nice, it is not necessary to do any research because it is already like a beautiful natural vegetation landscape as original private retreats'.

Therefore, the approch in this study is necessary for the sites with poor natural vegetation community. The sites with poor natural vegetation need to be complemented by planting to achieve more beautiful and sustainable landscape. If determining what type of landscap (waterfornt-riverside, waterfornt-coast or inland-mountainous, inland-low slope area), the vegetation type would be determined following the landscape type, and then the representative plants community which can be refered as a model would also be determined. Refering the species in the plants community, to complement the poor vegetation of the site, check out the list in chapter II and select the ecollogically harmonious plants species for tradtional landscape architecture and combine the species for the planting.

This approach can provide a possible and reasonable reference for one's plants species selection in planting design process which make the product, a private retreat style garden, possible to be an

ecologically sustainable and great scenic garden.

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국문 초록

근래에 이르러 전통조경에 대한 연구 및 이를 현대조경에서 재현하려는 시도가 다양하게 나타나고 있다. 근래에 재현된 많은 전통정원형 조경공간은 누정원림으로 대표되는 별서정원의 경관을 모방하고 있다. 인접한 경승지나 전원지에 은둔과 은일 또는 자연을 즐기기 위해 조성하였던 별서 누정원림의 조성에 있어서는 '아름다운 자연경관 속의 입지선정' 이 가장 중요한 요소이나 경승지에 위치했던 전통적인 누정원림과 달리 오늘날 재현되고 있는 전통정원들의 대상지는 빈약한 자연경관을 지닌 도심 또는 도시인근인 경우가 대부분이다. 따라서, 근래의 누정원림형 전통정원들은 누정원림의 자연친화적이고 아름다운 전통적 경관을 충분히 재현하고 있지 못한 실정이다. 이러한 입지의 한계성 문제를 극복하기 위해서는 빈약한 자연식생경관에 대한 식재부분에서의 보완적 조치가 고려되어야 한다.

본 연구의 주요 목적은 전통 누정원림을 재현하는 정원의 조성에 있어서, 누정원림의 자연친화적 식생경관의 재현을 위해 입지의 빈약한 자연식생으로 인해 보완이 필요한 배후경관 및 외원 영역의 식재 설계에 활용할 수 있는 생태적으로 상호조화로운 전통조경식물종 및 이들의 바람직한 생태학적 종조합의 선정 방법을 제안하는 것이다. 이러한 식물종 및 식물종조합의 선정은 경관유형별로 나누어 접근될 것이며, 선정의 근거는 입지의 환경 정보를 내포하는 자연식생군락의 식생조사자료가 될 것이다. 결과적으로 이와같은 경관 유형별 전통조경식물종의 선정 방법은 빈약한 자연식생으로 인해 식재의 보완이 필요한 근래의 다양한 전통정원 재현형 조경공간의 생태적 식재설계에 활용가능할 것이다.

본 연구의 접근방법은 (1)먼저 누정원림형 전통 정원의 식재 설계에 활용하기 위한 전통조경식물종의 종류 및 상징성을 조사하여 목록을 만들고, (2) 현존하는 누정원림의 입지에 따른 경관 유형을 조사하고 이를 유형화한 뒤, (3)각 경관 유형에 따른 자연식생의 서식처 유형을 선정한다. 그리고 (4)각 경관 유형별 서식처 유형에 해당하는 자연식생군락구조 자료를 수집하여 이를 본 연구의 전통조경식물종 목록과 대조하여 공통 식물종을 추출하여 각 경관 유형별 생태적으로 상호 조화로운 전통조경식물종조합을 찾아낼 것이다. 또한 상기한 바와 같이 찾아낸 경관 유형별 생태적으로 상호 조화로운 전통조경식물종조합을 포함하는 (5)경관 유형별 식물종 선정의 예를 제시할 것이다. 결론부에서는 본 연구에서 찾아낸 생태적으로 상호 조화로운 전통조경식물종조합의 활용가능성과 추가 연구의 필요성을 전망할 것이다.

주요어: 한국전통정원, 재현, 경관 유형, 전통 경관, 전통조경식물, 식물군락, 생태적 식물종조합

학번: 2009-22166

Acknowledgements

It is a pleasure to thank my thesis director, Prof. Wybe Kuitert for his kind advice and sincere support, and Prof. Jonghwa Park and Prof. Yumi Lee for their grateful supervision. And I also would like to give my special thanks to Hosoo, Chaejun and him... .